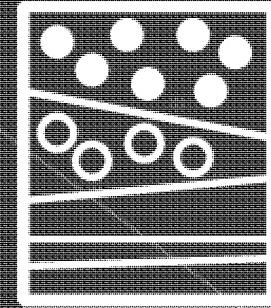


**PX 333**

# Geophysics

## Full field G&G Workshop

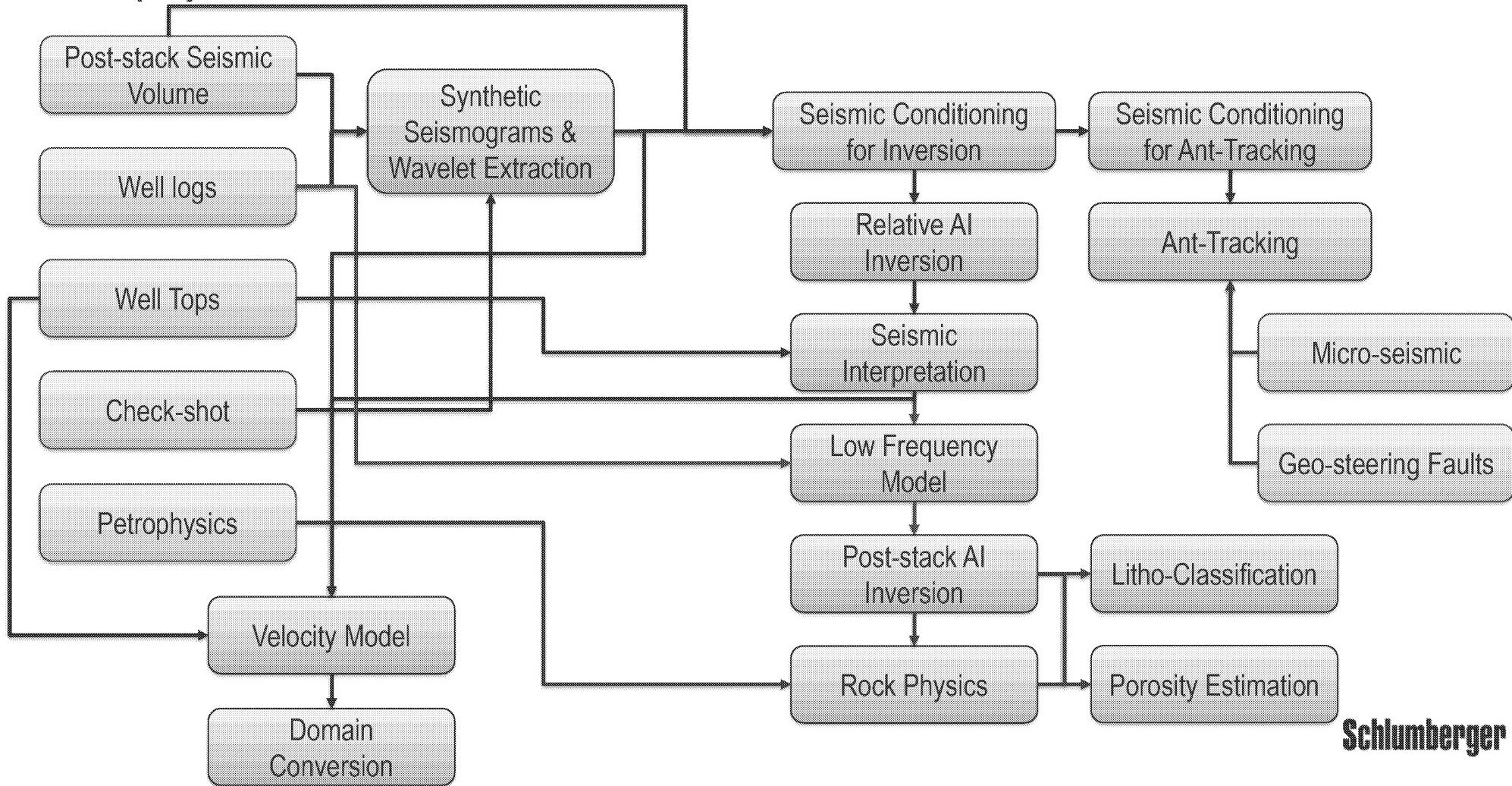


Ivan Salazar – Senior Reservoir Geophysicist

May 24<sup>th</sup>, 2018

Schlumberger

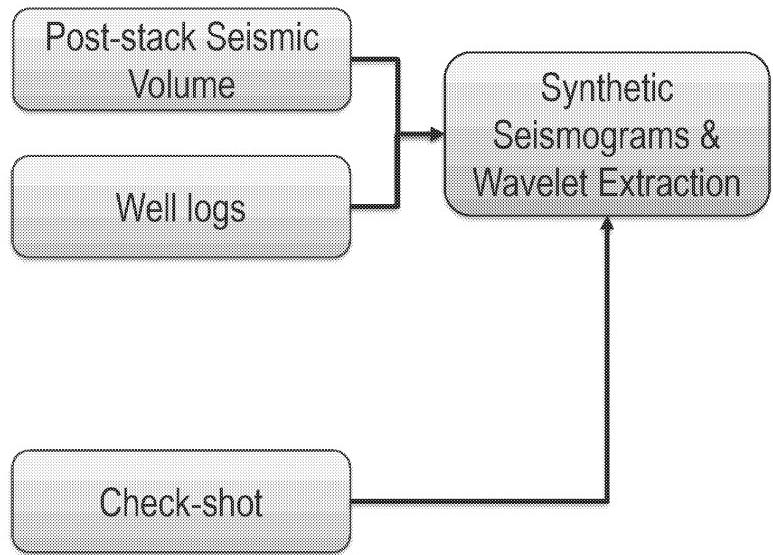
# Geophysics Workflow Overview



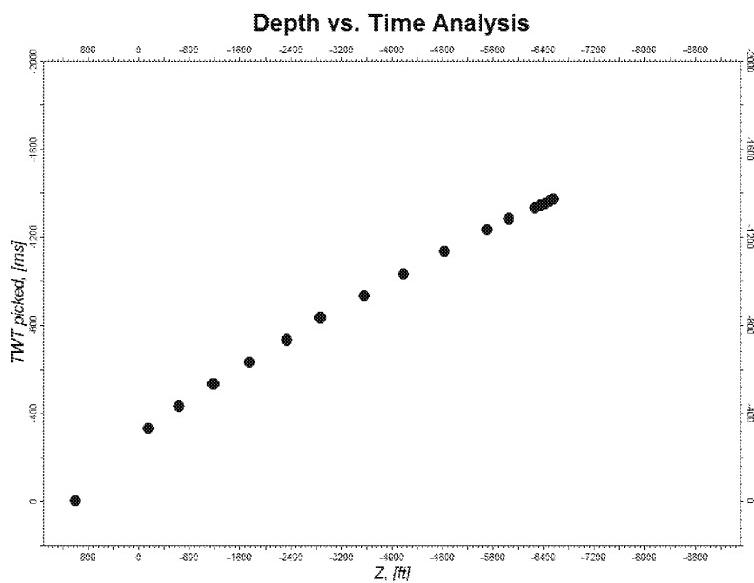
Schlumberger Confidential

**Schlumberger**

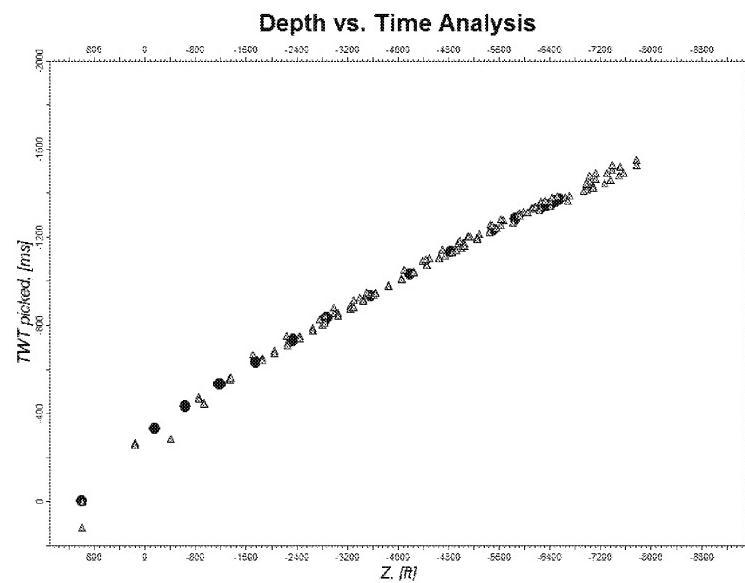
# Geophysics Workflow Overview



# Initial Time-Depth Relations



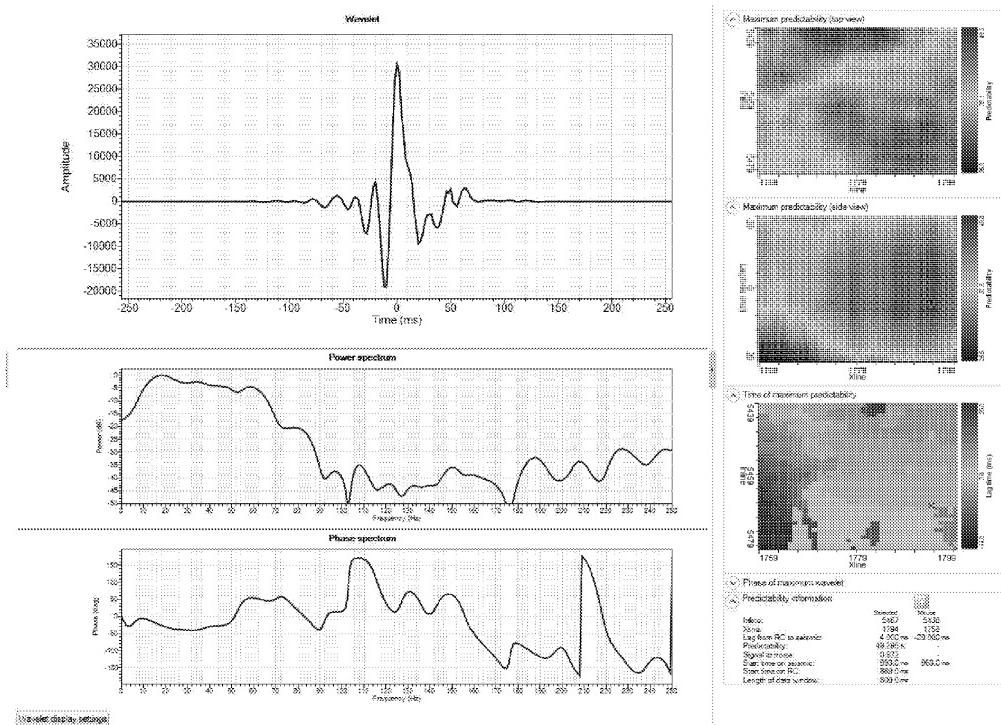
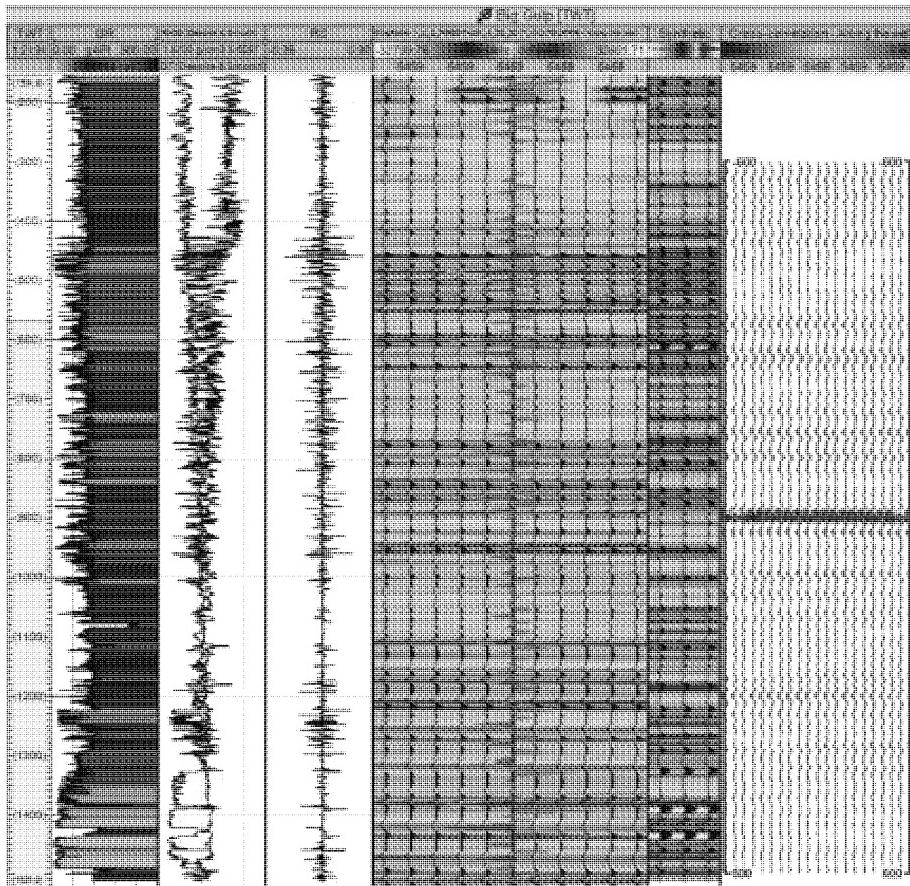
EHU 212 Original Check-shot



EHU 212 Original Check-shot  
and Additional Wells

**Schlumberger**

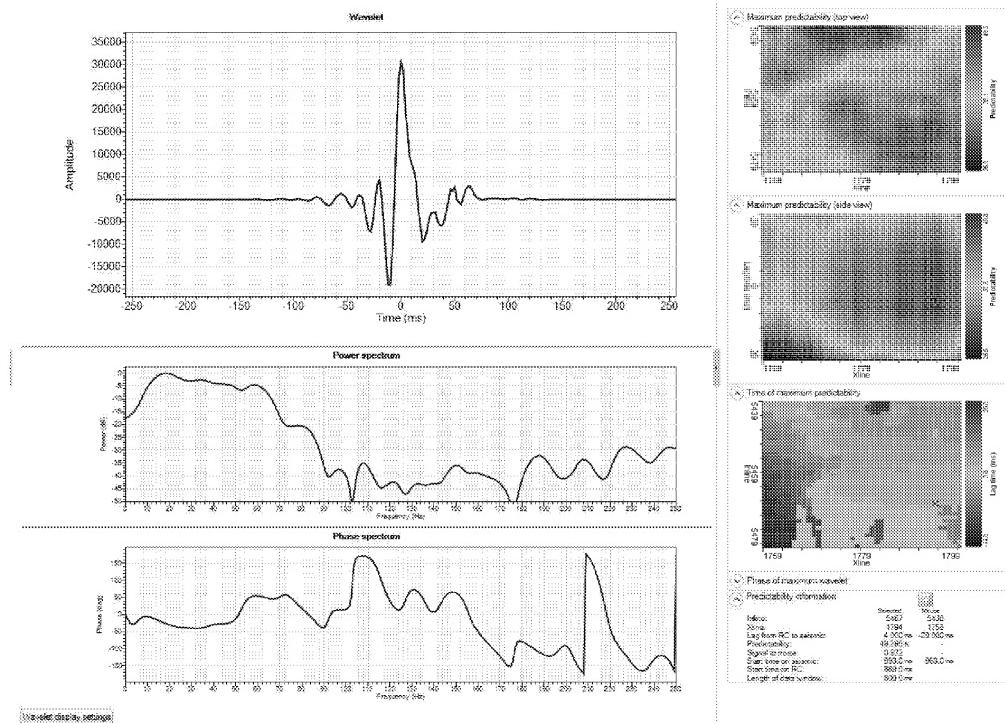
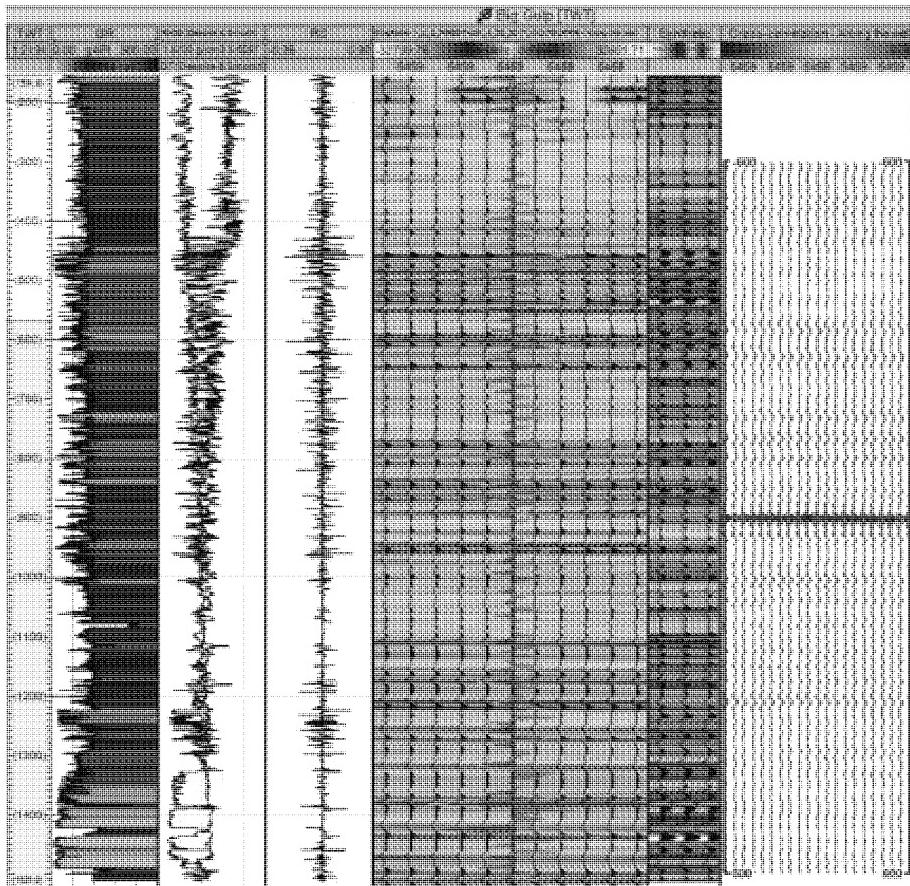
# Deterministic Wavelet Extraction Big Gulp



Maximum Cross-correlation:  
(300ms to 1500ms)  
Statistical Wavelet: 53.9%

**Schlumberger**

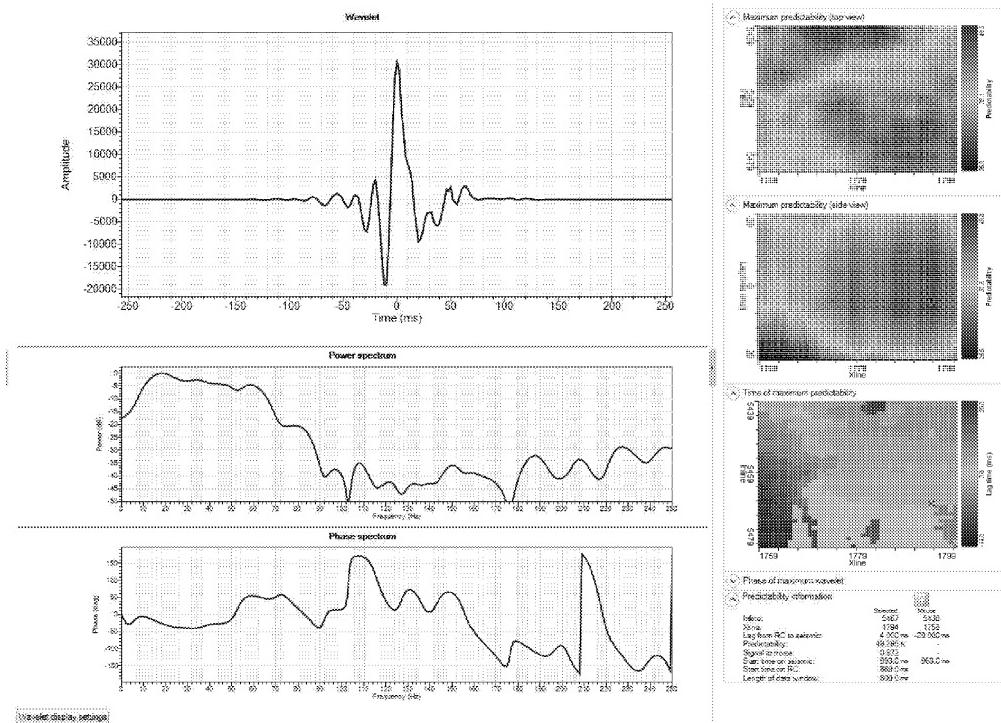
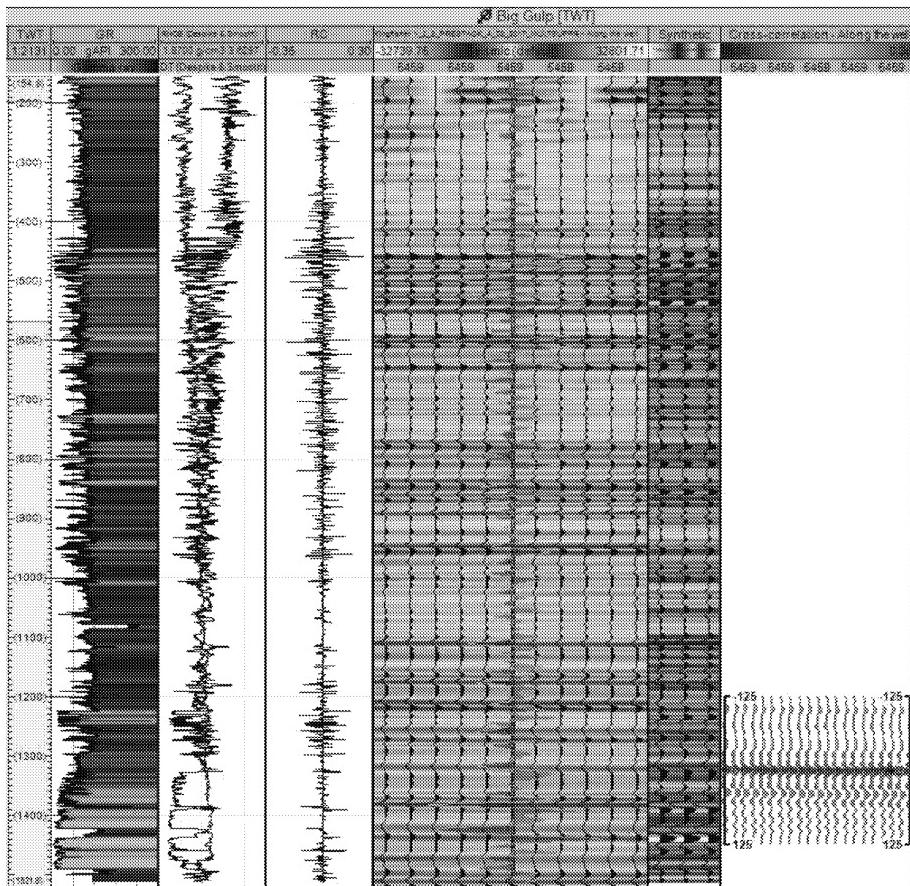
# Deterministic Wavelet Extraction Big Gulp



Maximum Cross-correlation:  
(300ms to 1500ms)  
Deterministic Wavelet: 60.6%

**Schlumberger**

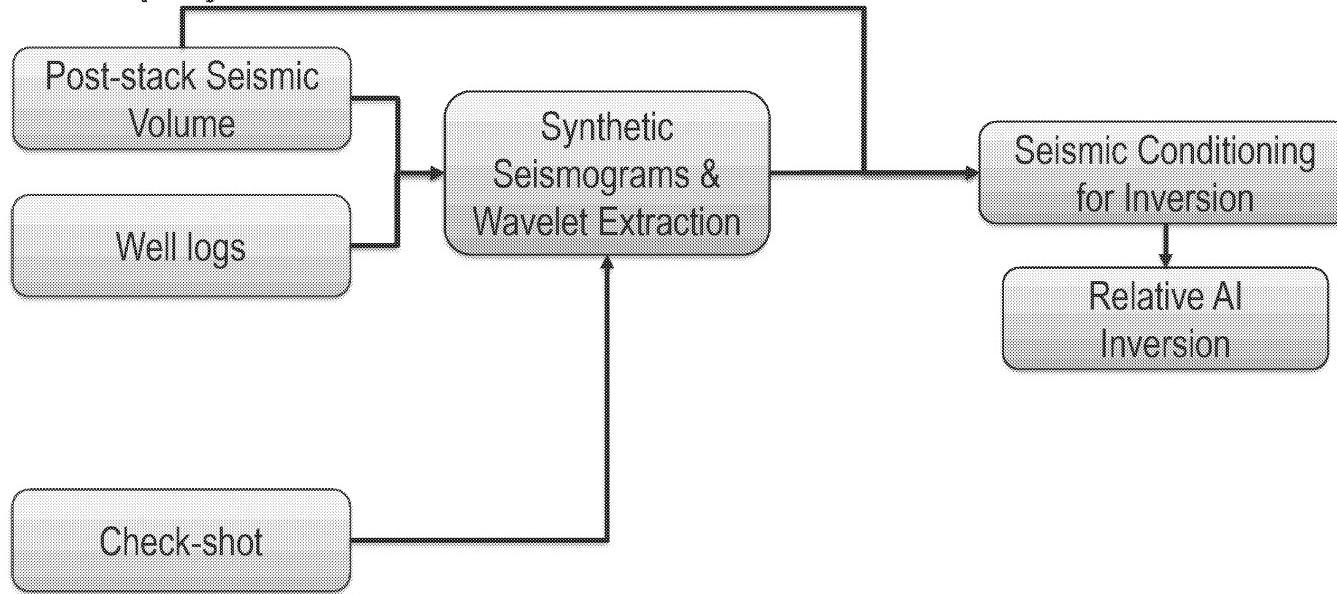
# Deterministic Wavelet Extraction Big Gulp



Maximum Cross-correlation:  
(1200ms to 1450ms)  
Deterministic Wavelet: 75.1%

**Schlumberger**

# Geophysics Workflow Overview



**Schlumberger**

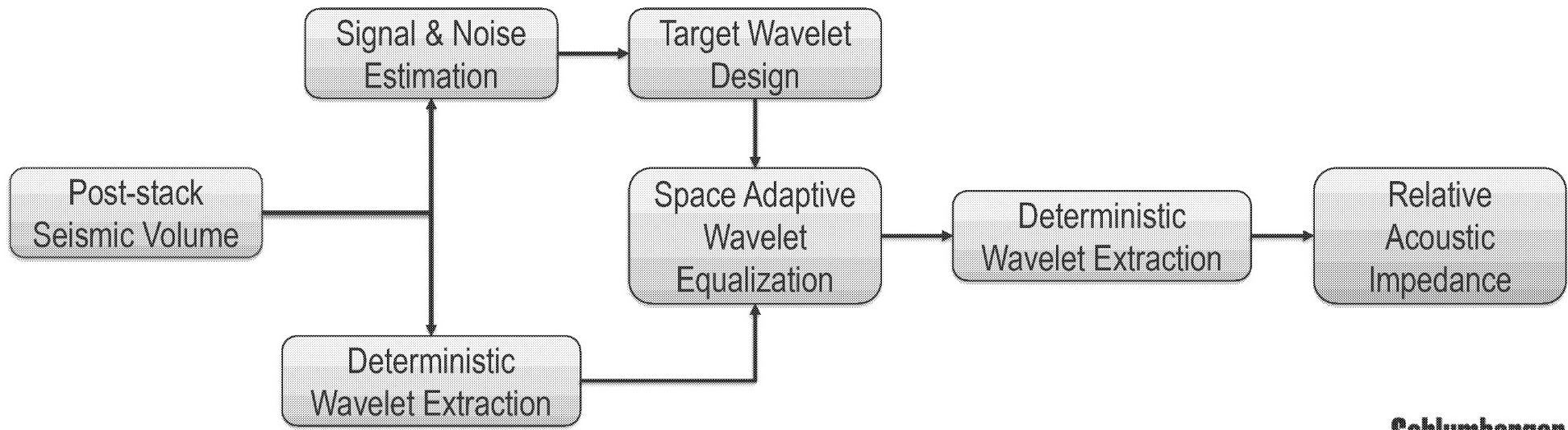
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# Relative Acoustic Impedance Workflow

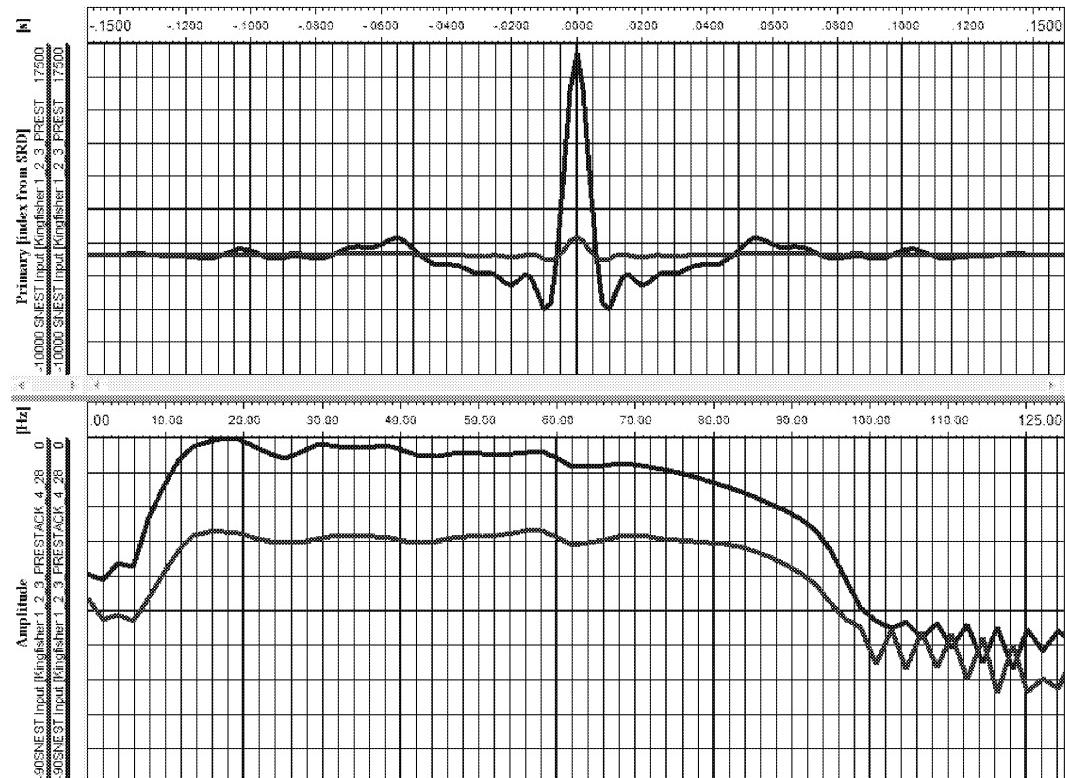
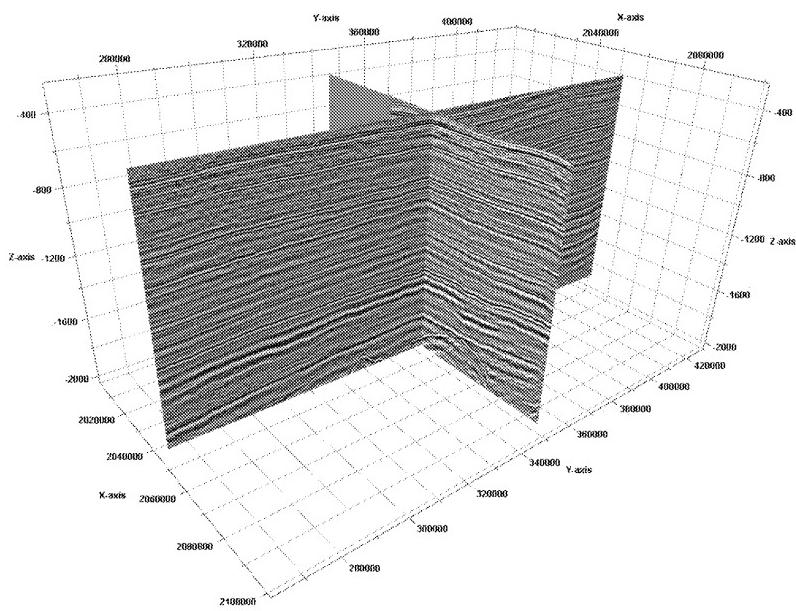
## Objective

Obtain high resolution relative acoustic impedance traces in order to provide data for detailed interpretation and calibration.



**Schlumberger**

# Signal & Noise Estimation

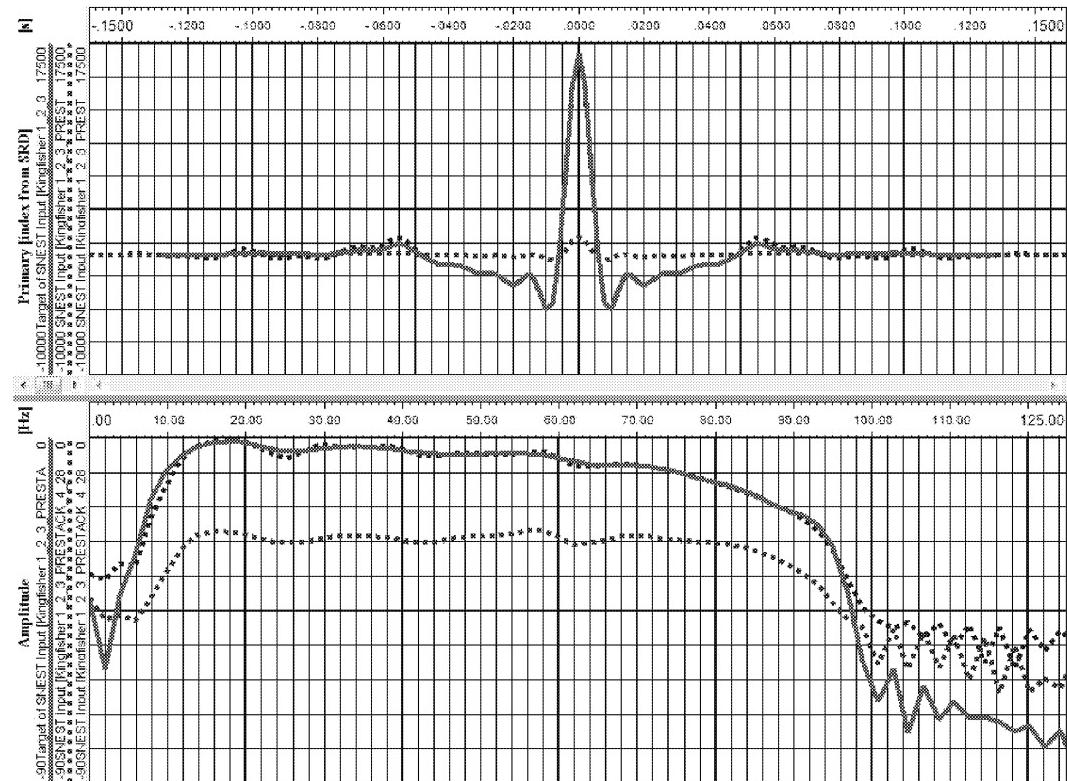
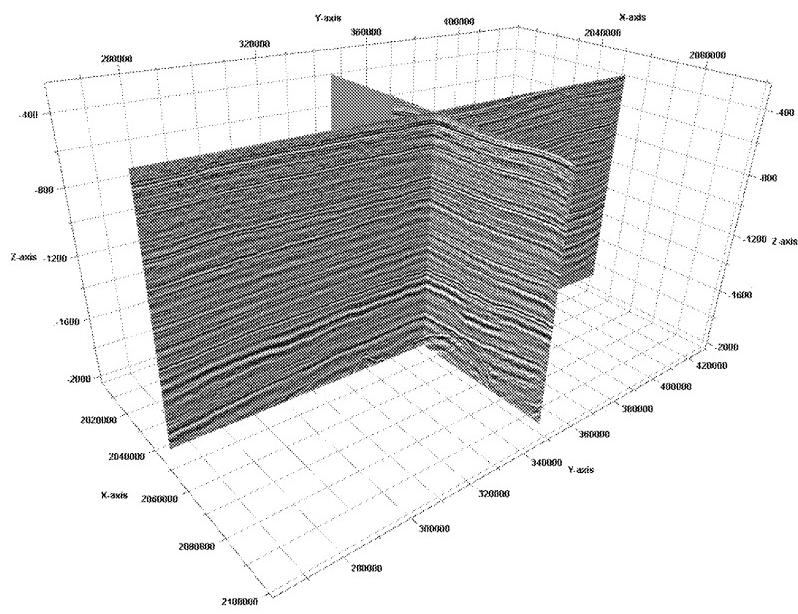


Signal  
Noise

S/N Ratio = 10

**Schlumberger**

# Target Wavelet Design



Signal  
Noise

S/N Ratio = 10  
Target Wavelet

**Schlumberger**

## Space Adaptive Wavelet Equalization - SAWE

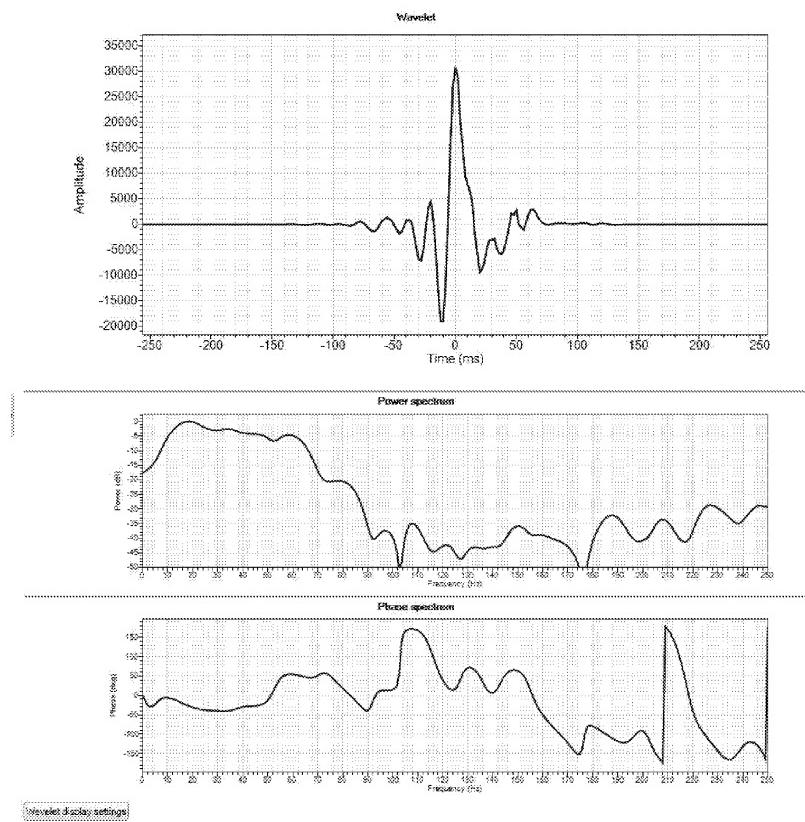
- It's a 3D wavelet shaping method, which corrects the wavelet in the data close to zero phase and stabilizes residual variations in space.
- The stabilization of the wavelet is performed by estimating and compensating for the space variant component (associated with the propagation effects in the overburden) and the non-space variant component (contributed by acquisition or processing systems) of the wavelet.
- The process produces space adaptive zero-phasing operators for each seismic trace.

*Detailed reservoir definition by integration of well and 3-D seismic data using space adaptive wavelet processing*

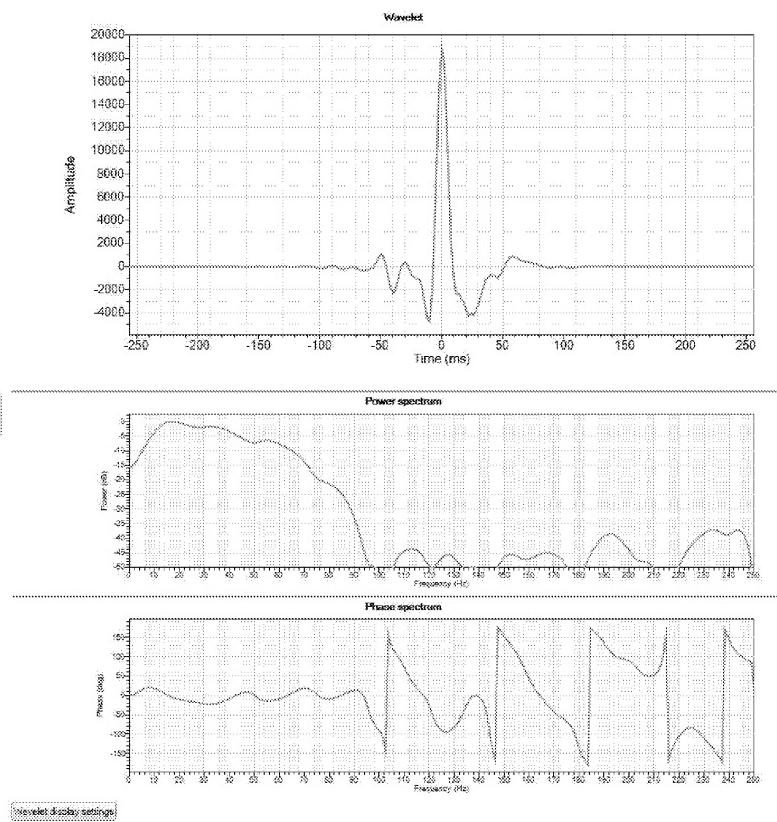
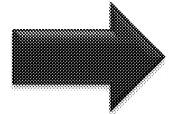
Society of Exploration Geophysicists. Elio Poggiagliolmi & Ron D. Allred.

**Schlumberger**

# Deterministic Wavelet Extraction *Big Gulp*



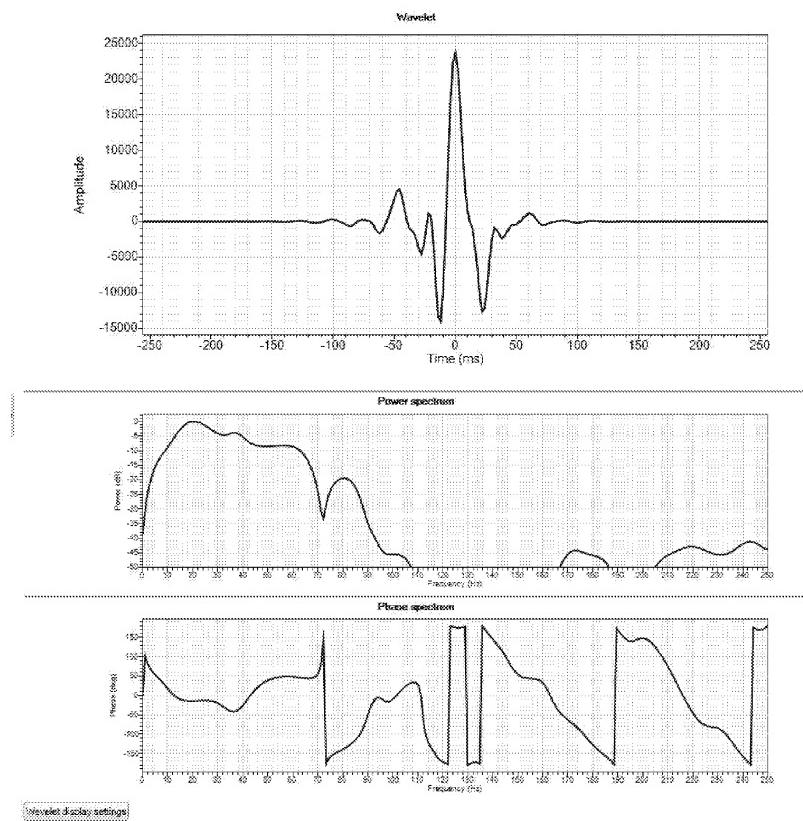
Before SAWE



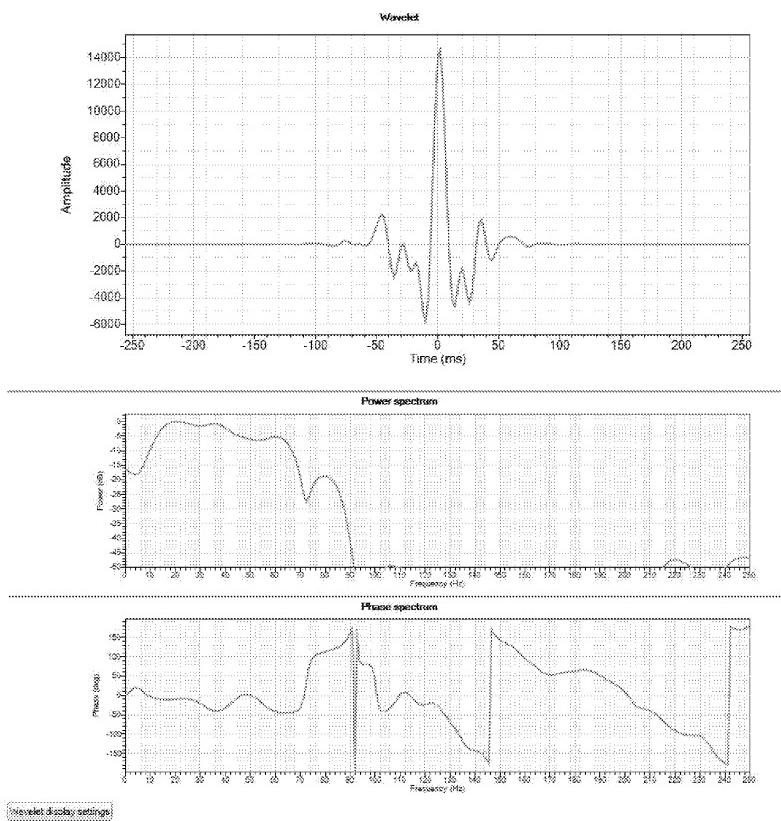
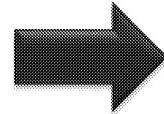
After SAWE

**Schlumberger**

# Deterministic Wavelet Extraction FRANCIS 1706 Pilot 5-8 MH Pilot



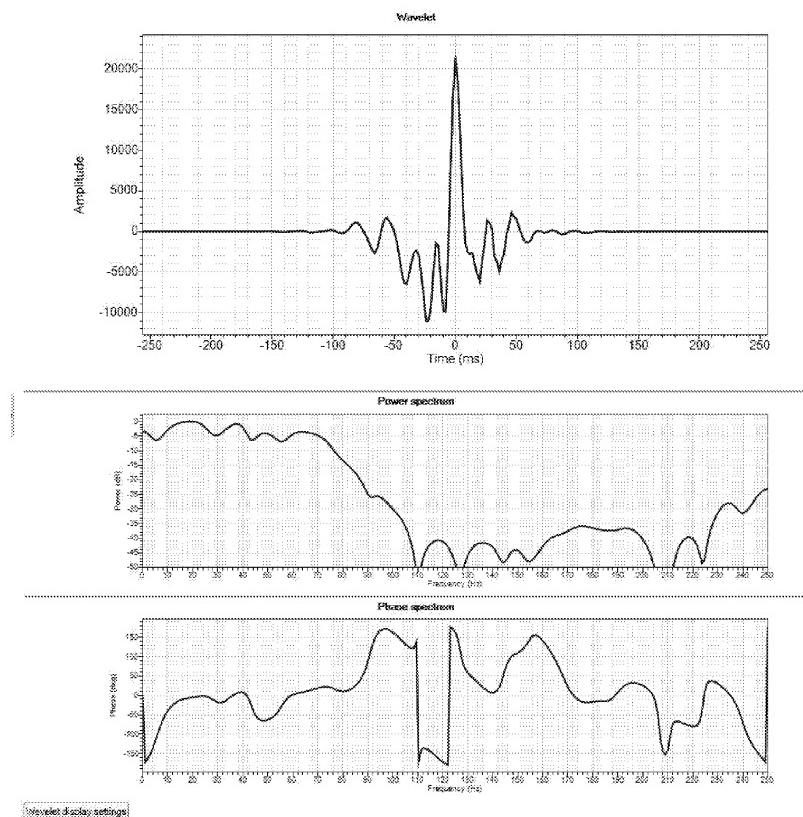
Before SAWE



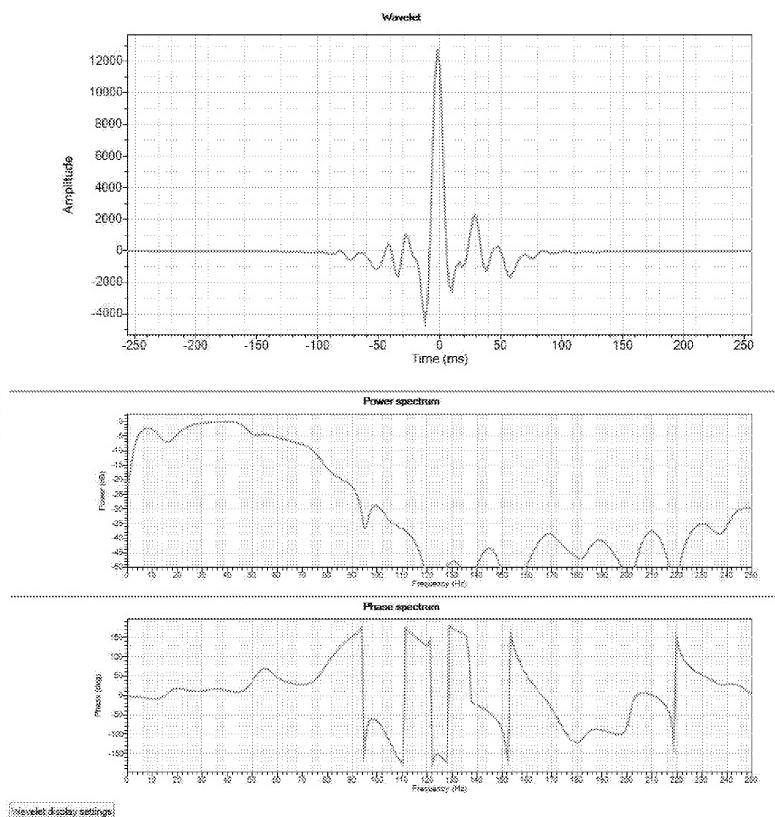
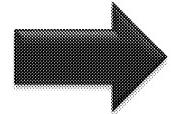
After SAWE

Schlumberger

# Deterministic Wavelet Extraction G STRIBEL 2



Before SAWE

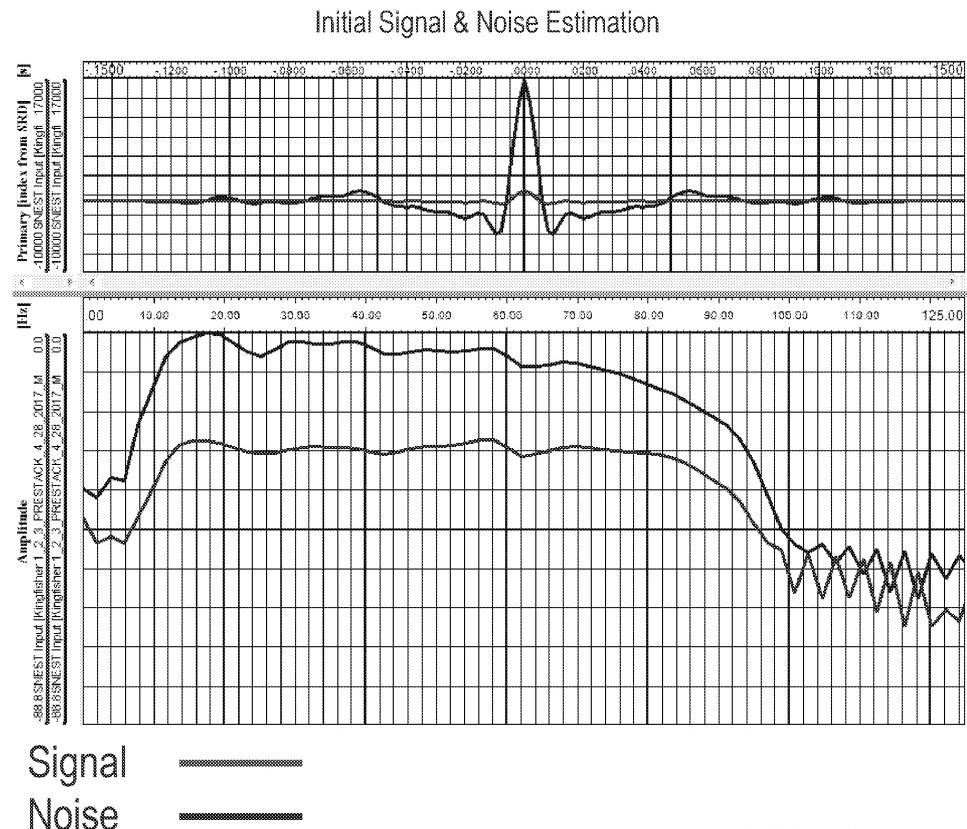


After SAWE

**Schlumberger**

# Relative Acoustic Impedance

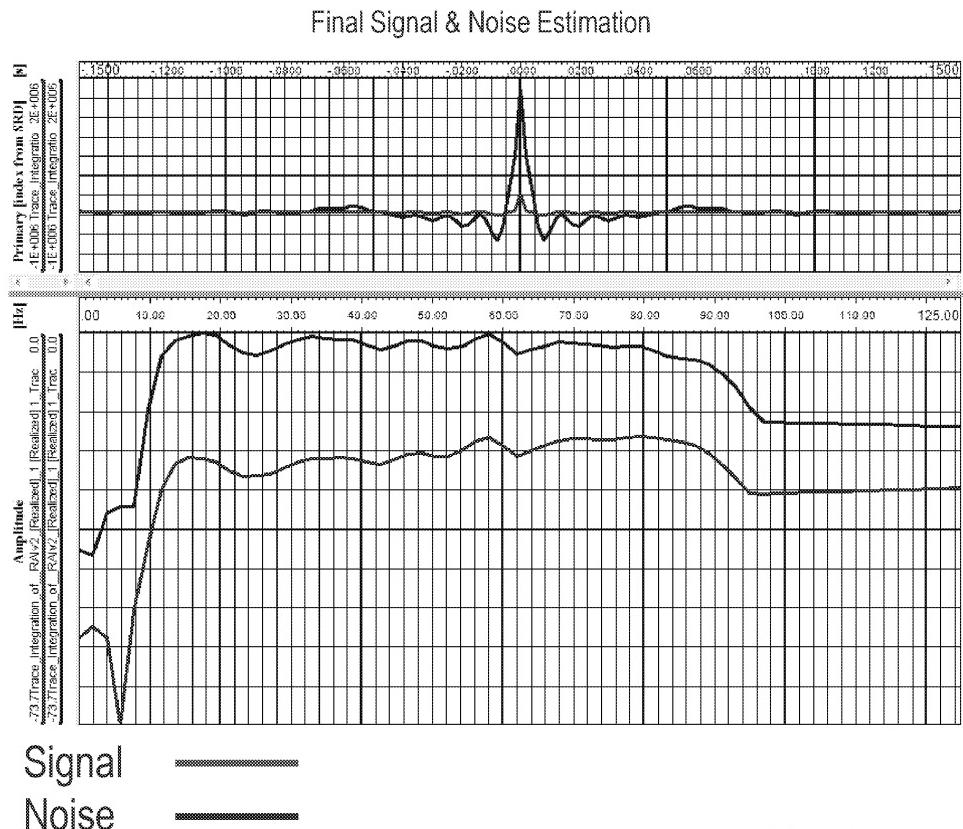
- Based on the most effective use of the information content in the trace, it obtains series of discrete acoustic interfaces
- Does not require any priory information to constrain the acoustic solution
- Allows for maximum flattening of the wavelet spectrum within the constraints imposed by the bandwidth, without deterioration of the SNR



**Schlumberger**

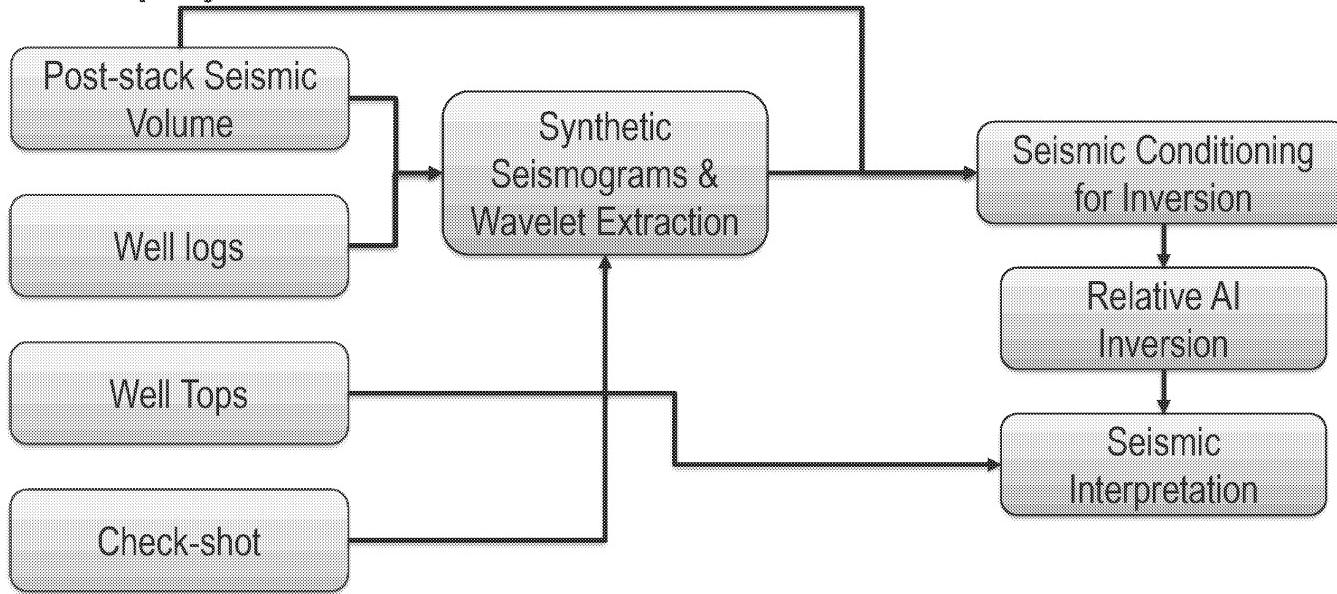
# Relative Acoustic Impedance

- Based on the most effective use of the information content in the trace, it obtains series of discrete acoustic interfaces
- Does not require any priory information to constrain the acoustic solution
- Allows for maximum flattening of the wavelet spectrum within the constraints imposed by the bandwidth, without deterioration of the SNR

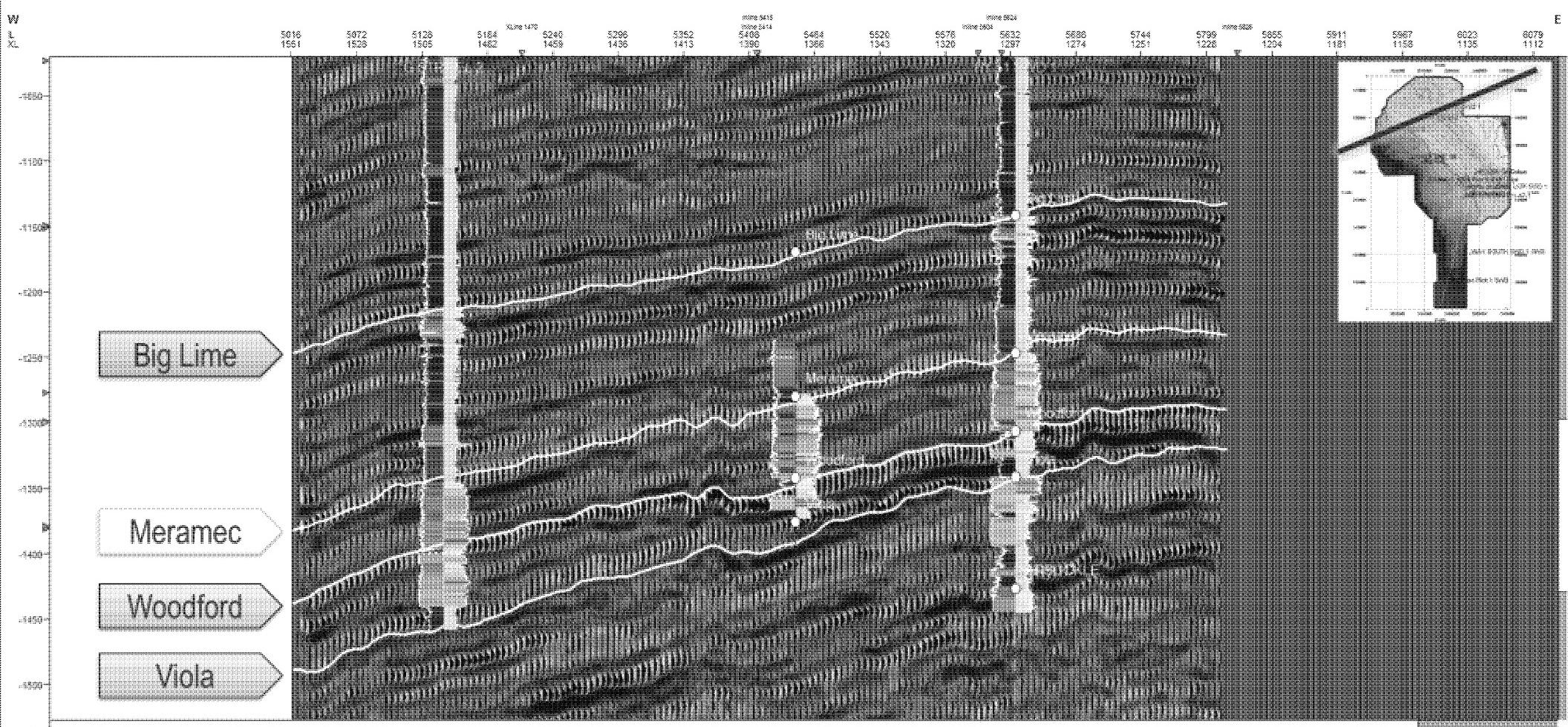


**Schlumberger**

# Geophysics Workflow Overview



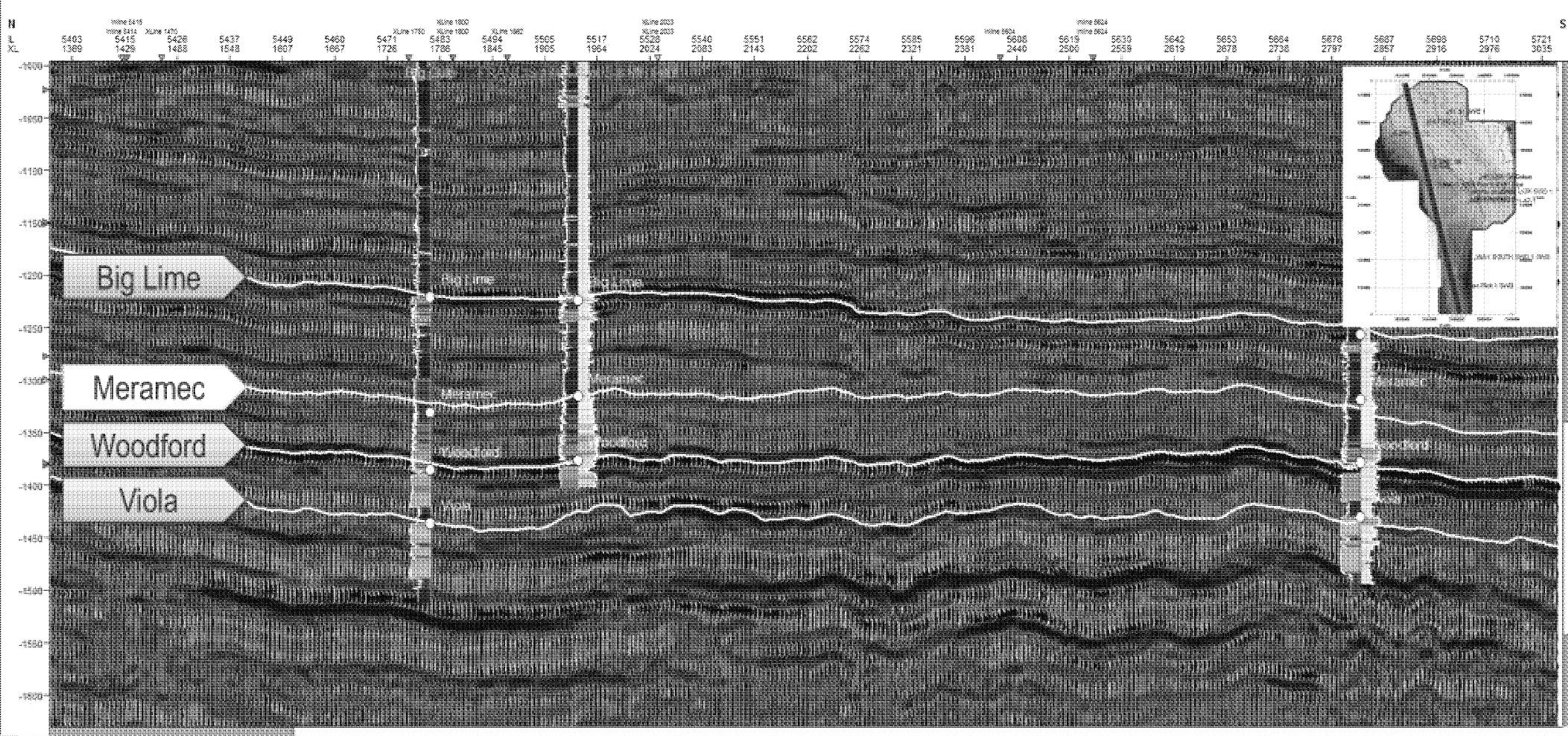
## Random Section W-E (G Stribel \ EHU 212 \ HY 51)



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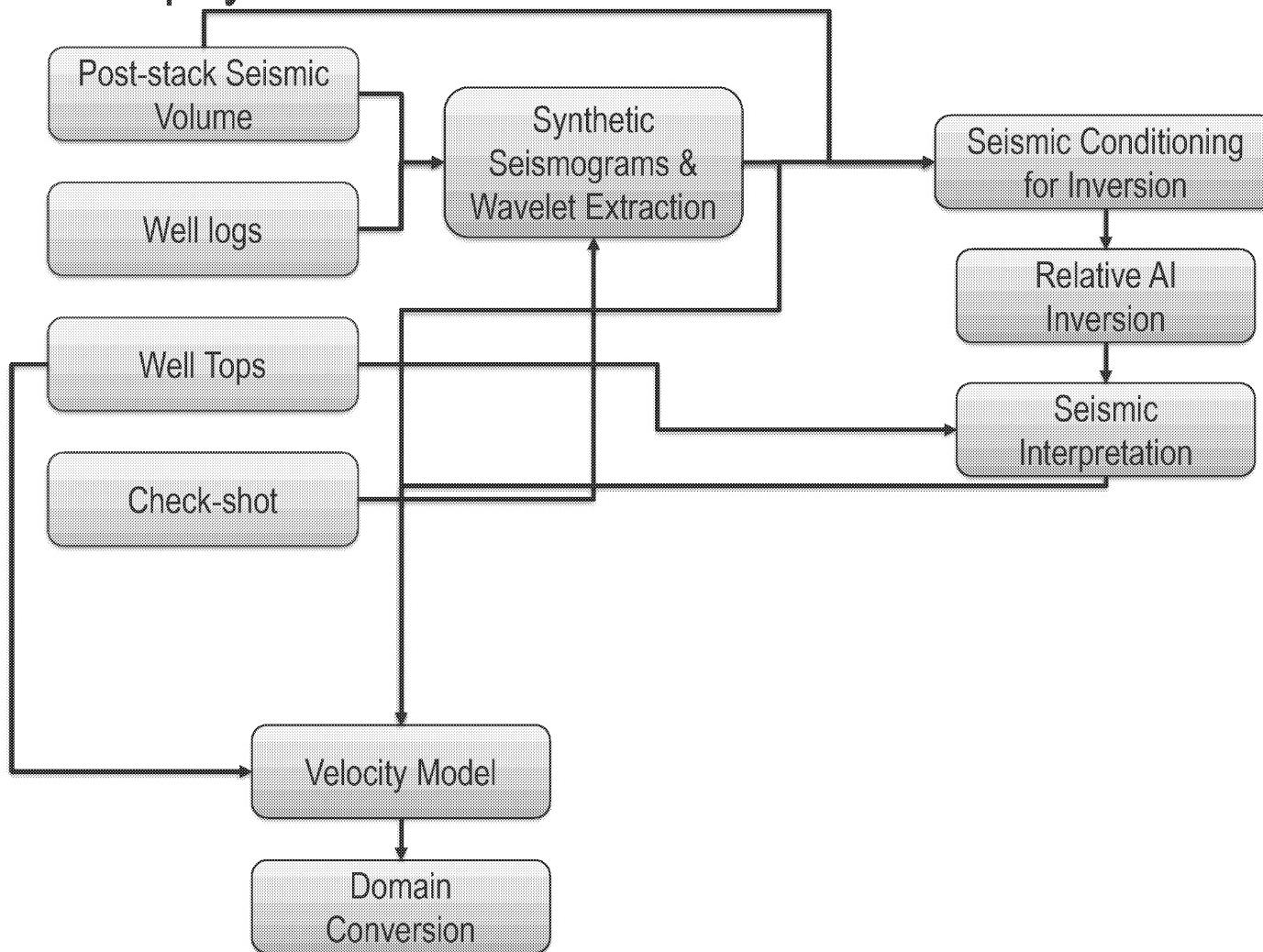
# Random Section N-S (Big Gulp \ Francis 1706 Pilot \ Huntsman Pilot 1)



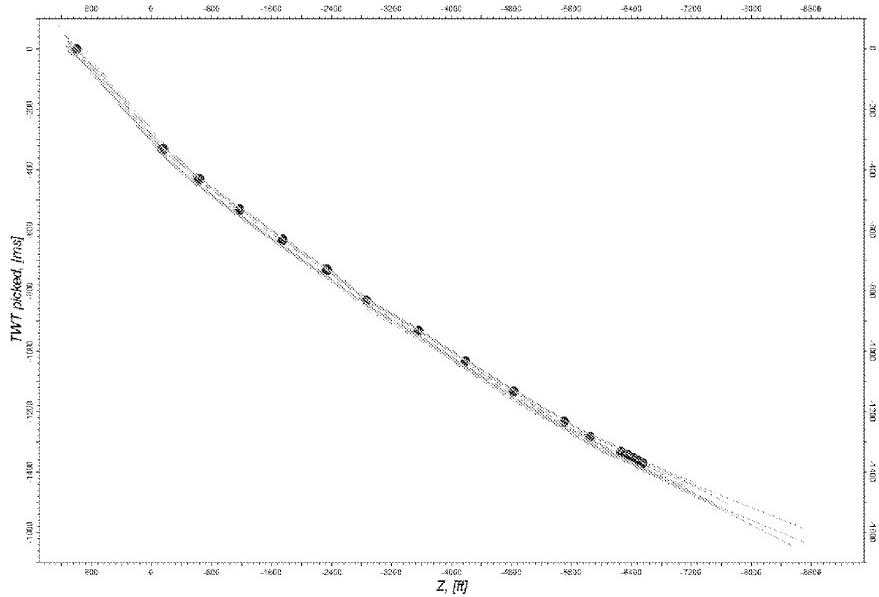
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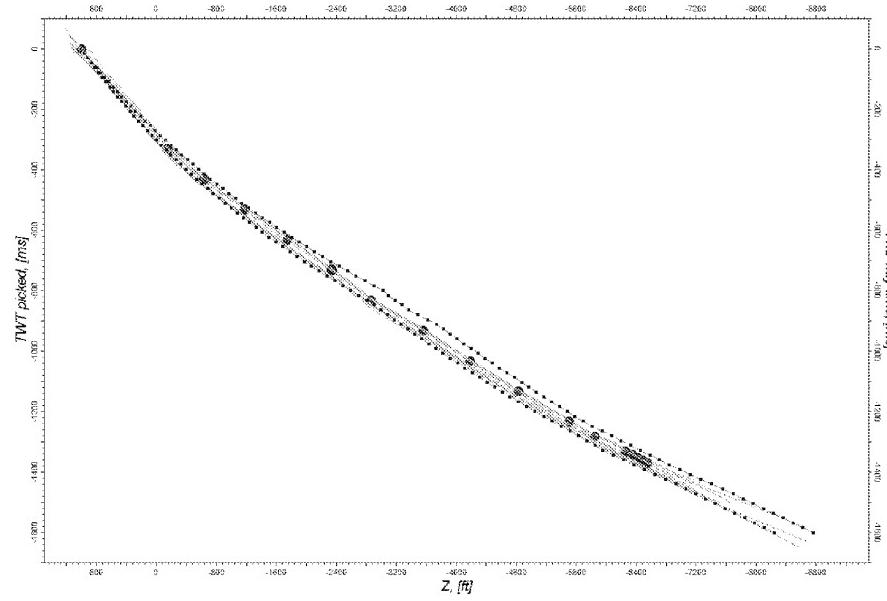
# Geophysics Workflow Overview



# Time-Depth Functions



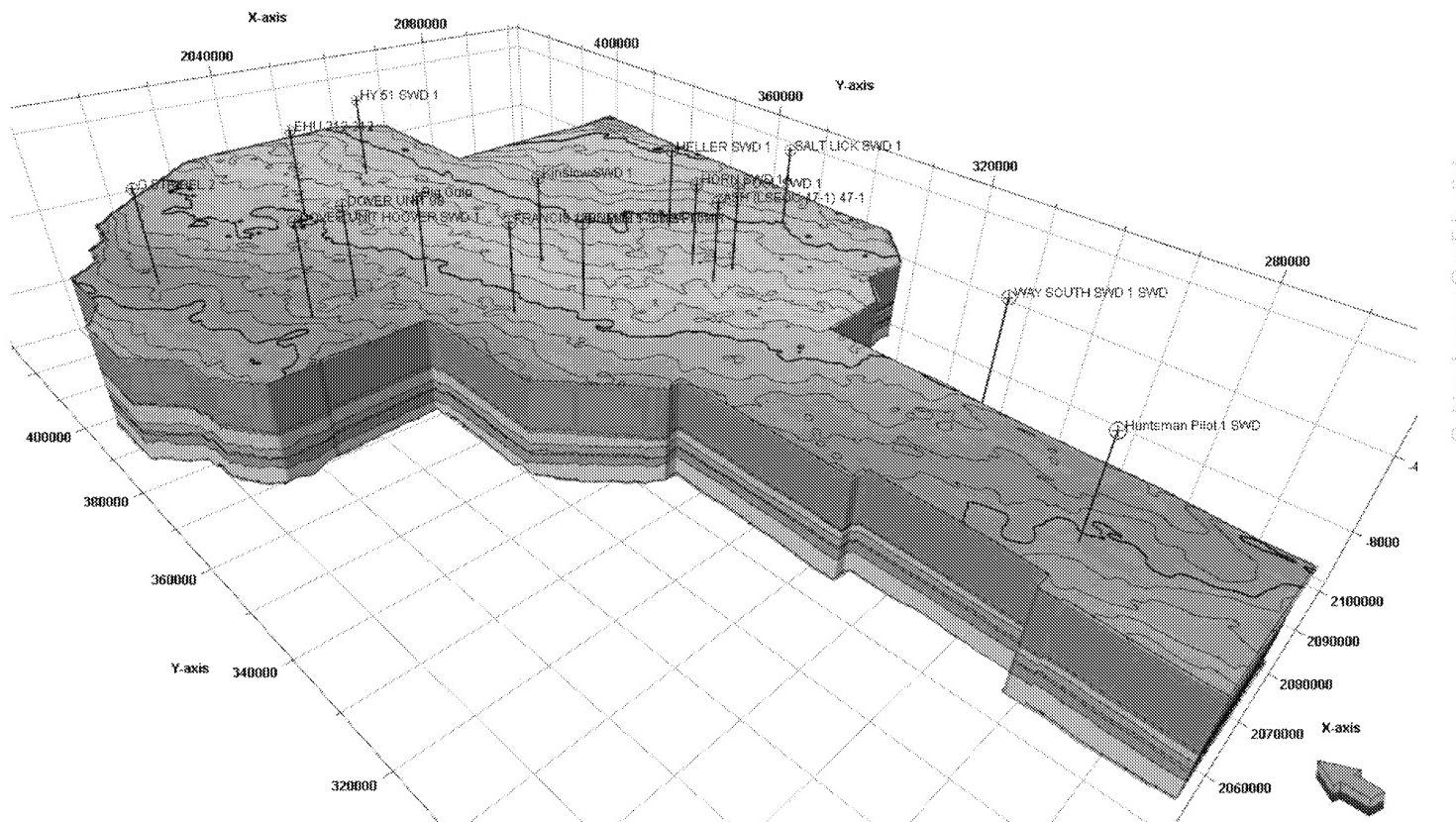
Check-shot EHU 212  
Time-Depth Relations



Check-shot EHU 212  
Time-Depth Relations  
Velocity Model Functions

# Final Surfaces in Depth

- Topeka
  - Big Lime
  - Oswego 5
  - Meramec
  - MLM
  - Woodford
  - Viola
  - Arbukle

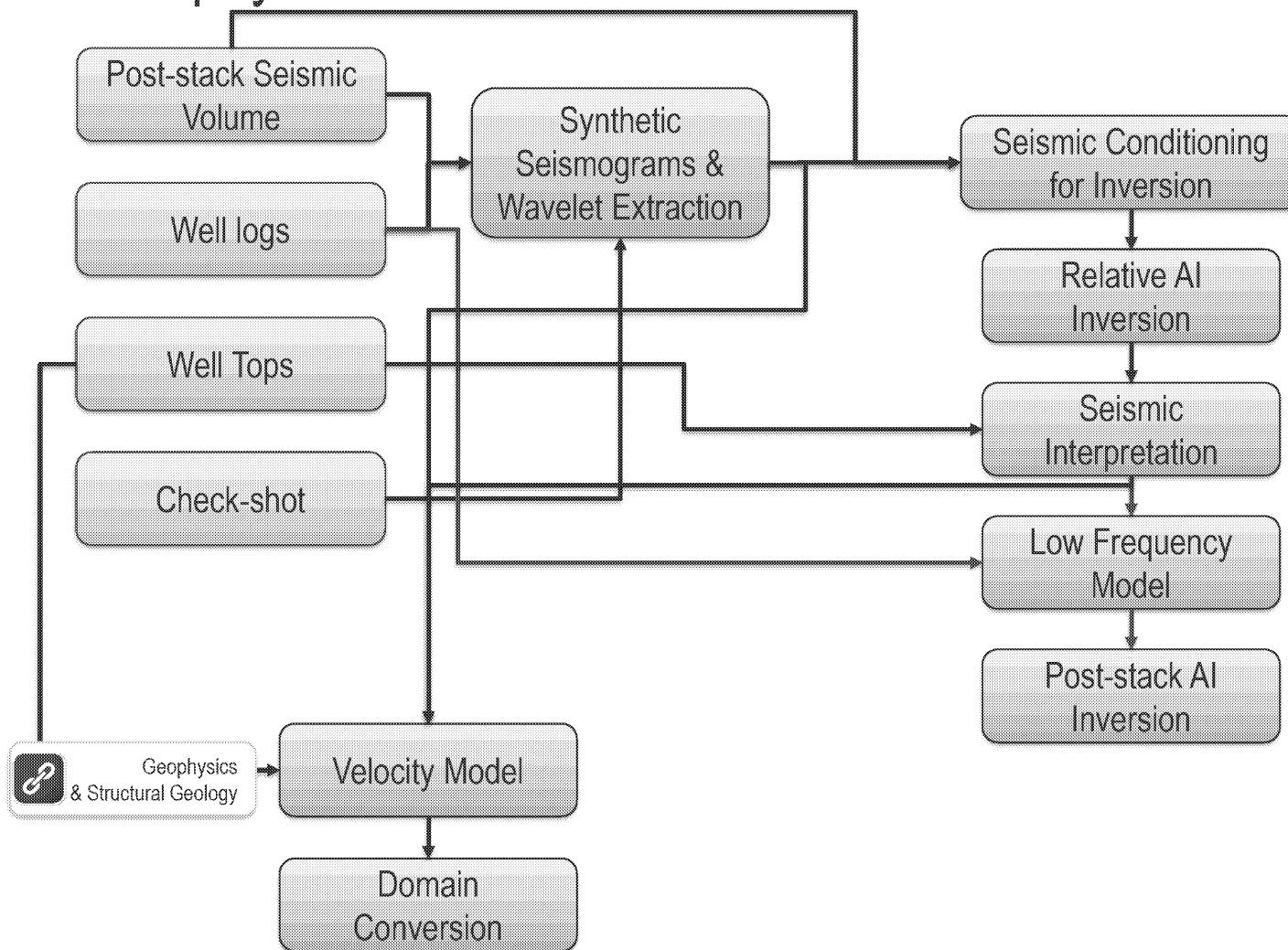


**Schlumberger**

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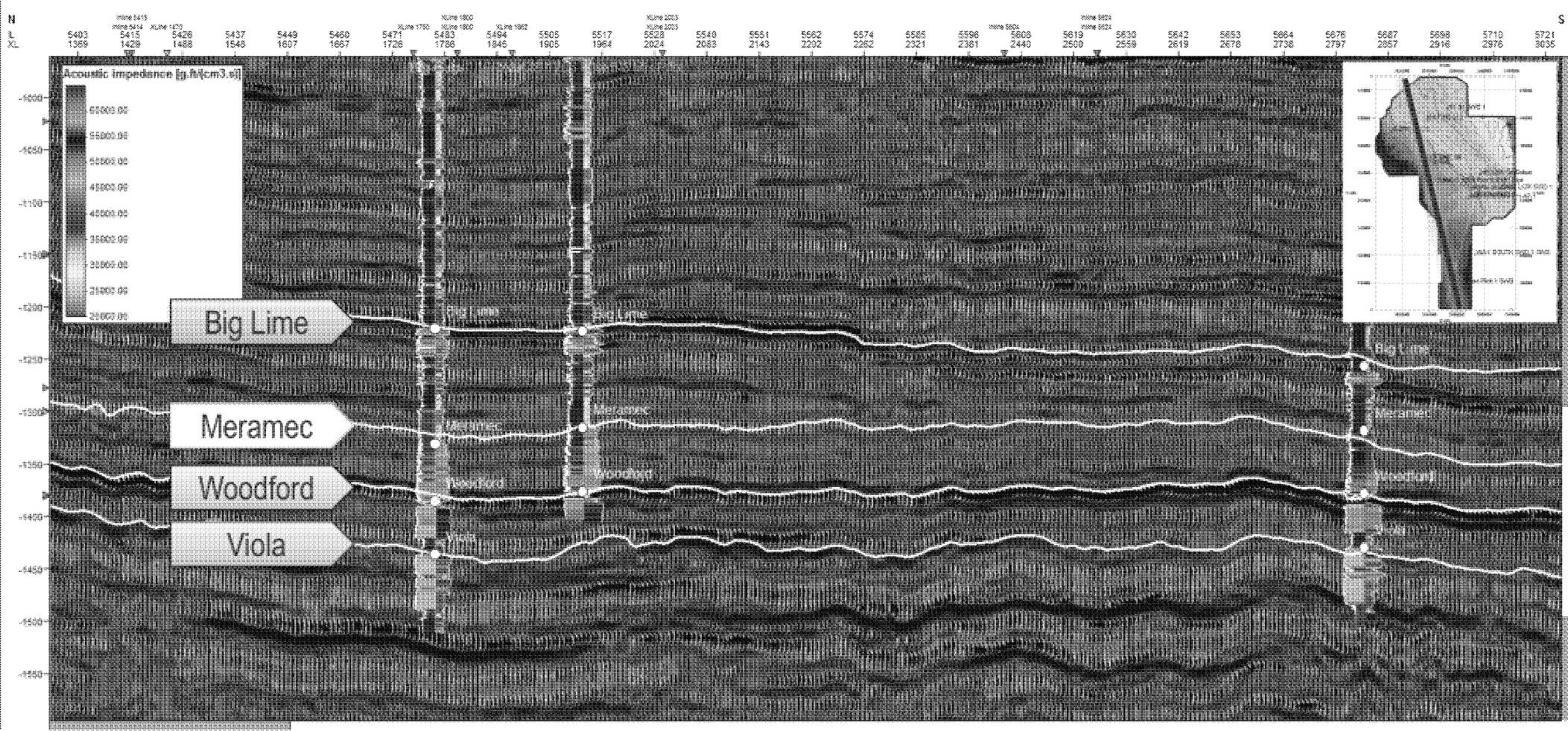
AMR\_SDTX01826856

# Geophysics Workflow Overview



# Low Frequency Model Building

Random Section N-S (Big Gulp \ Francis 1706 Pilot \ Huntsman Pilot 1)

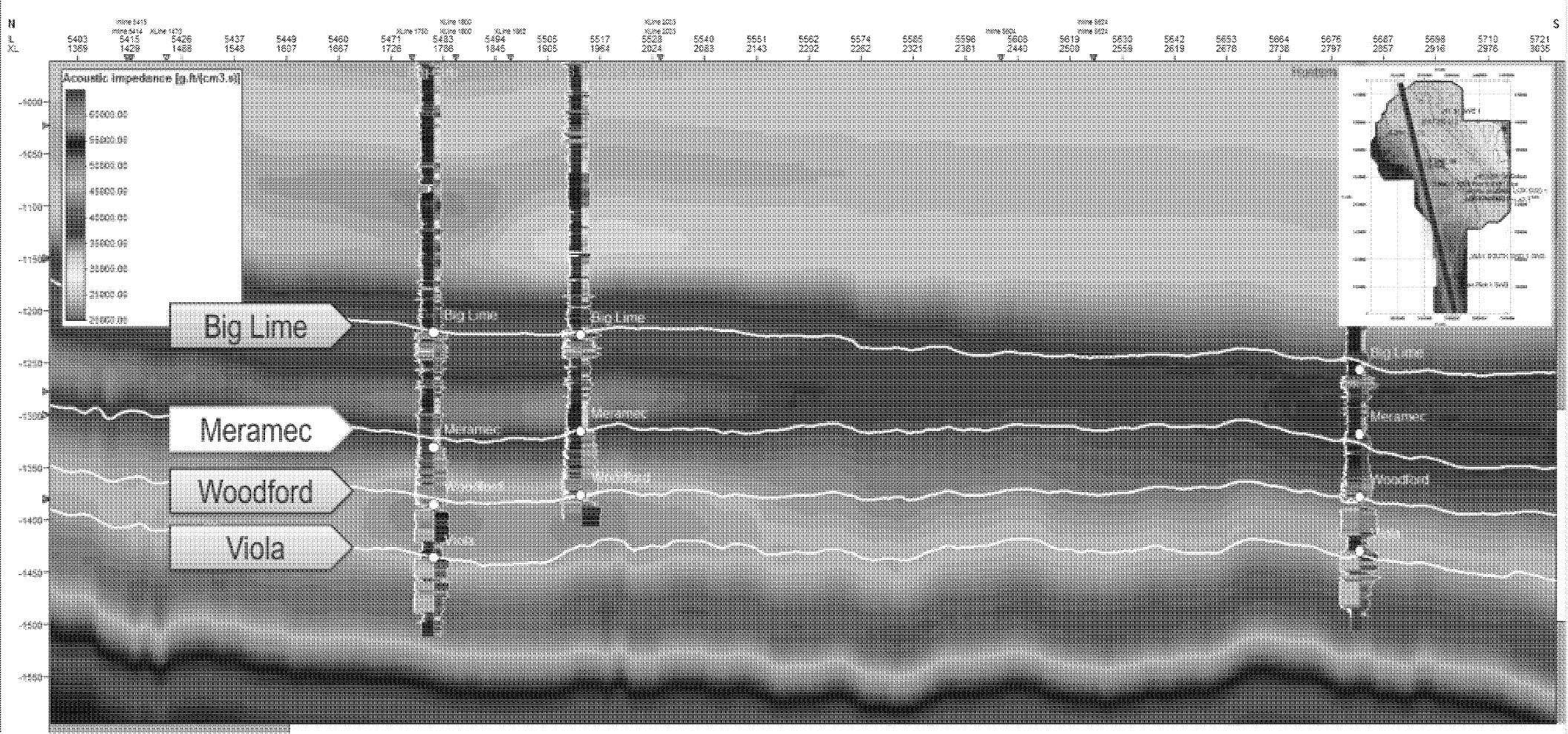


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# Low Frequency Model Building

Random Section N-S (Big Gulp \ Francis 1706 Pilot \ Huntsman Pilot 1)

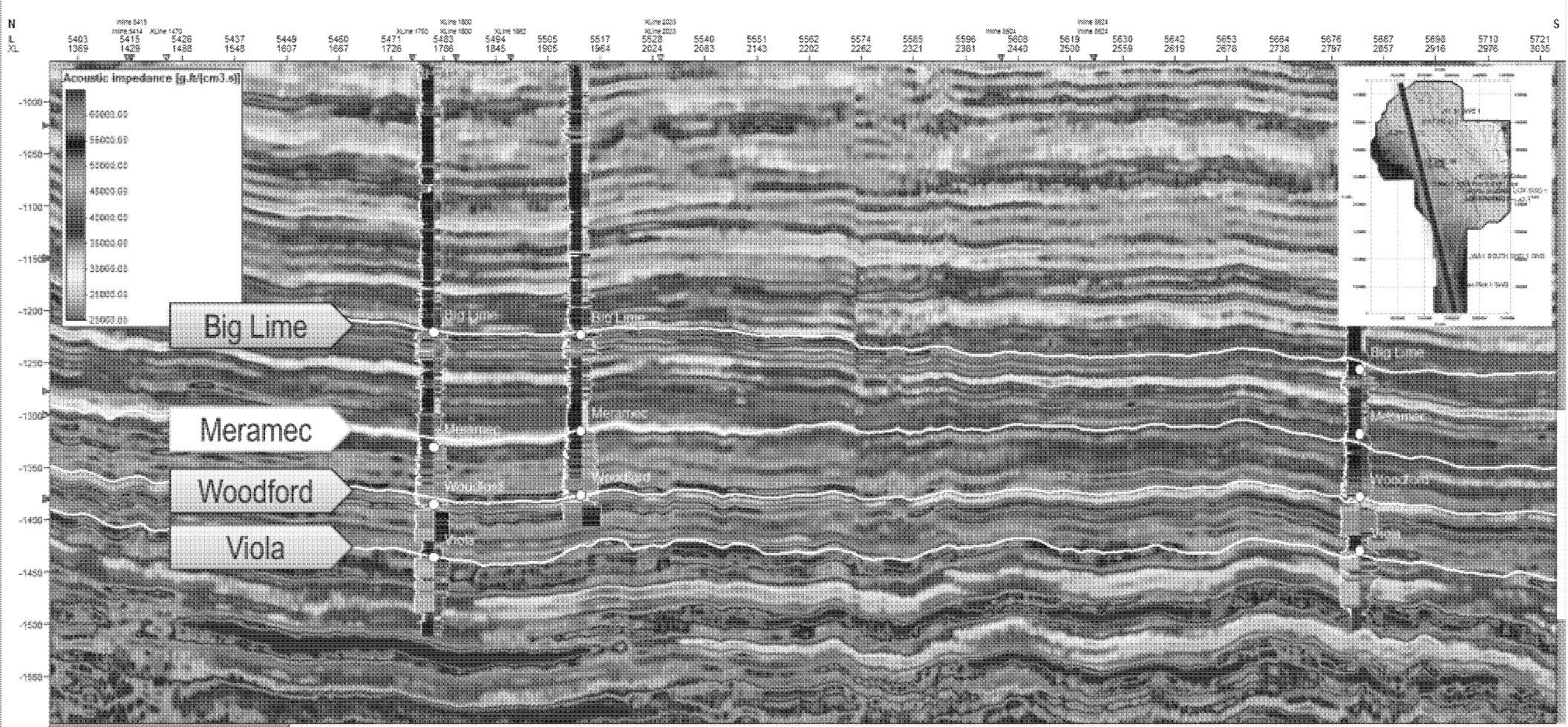


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# Post-stack Acoustic Impedance Inversion

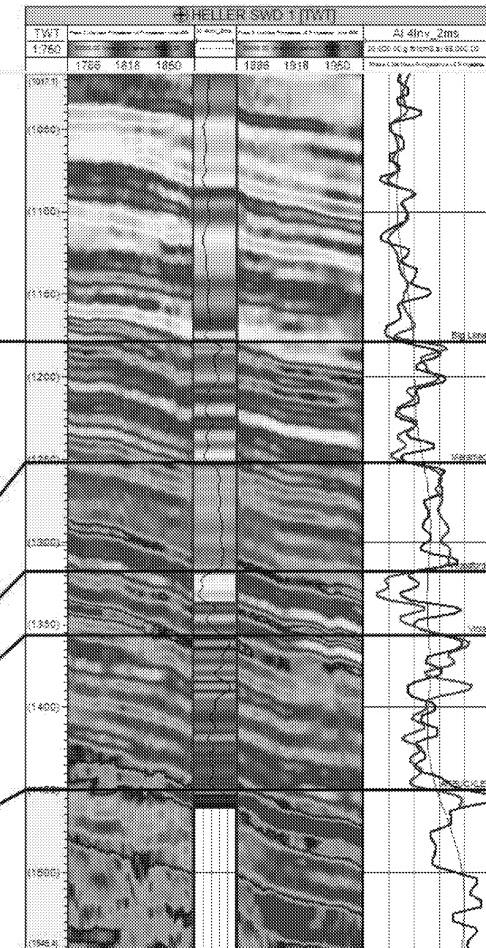
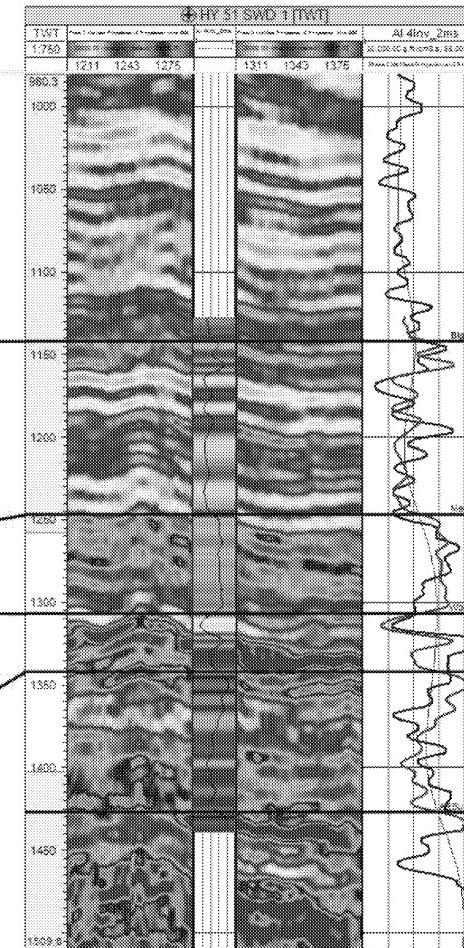
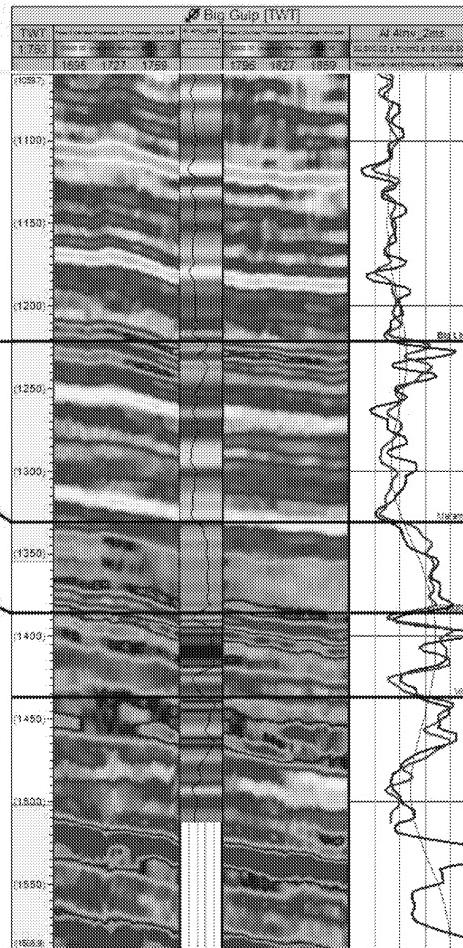
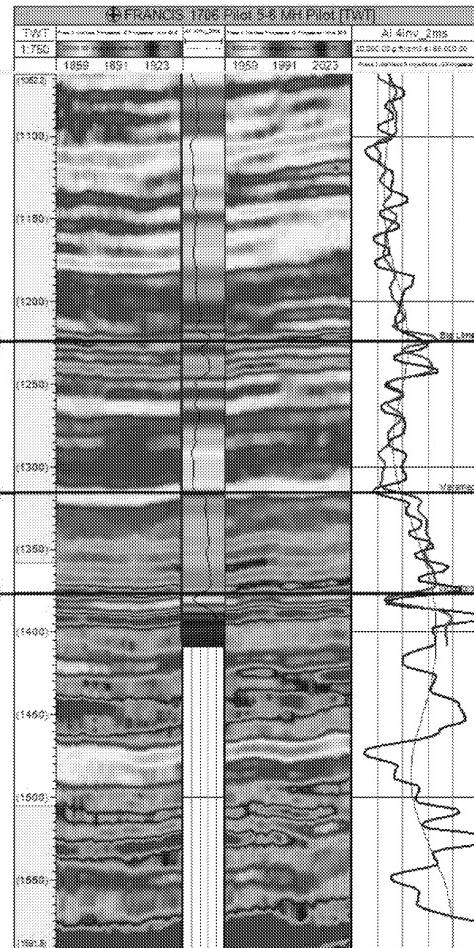
Random Section N-S (Big Gulp \ Francis 1706 Pilot \ Huntsman Pilot 1)



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# Post-stack Acoustic Impedance Inversion QC



Big Lime

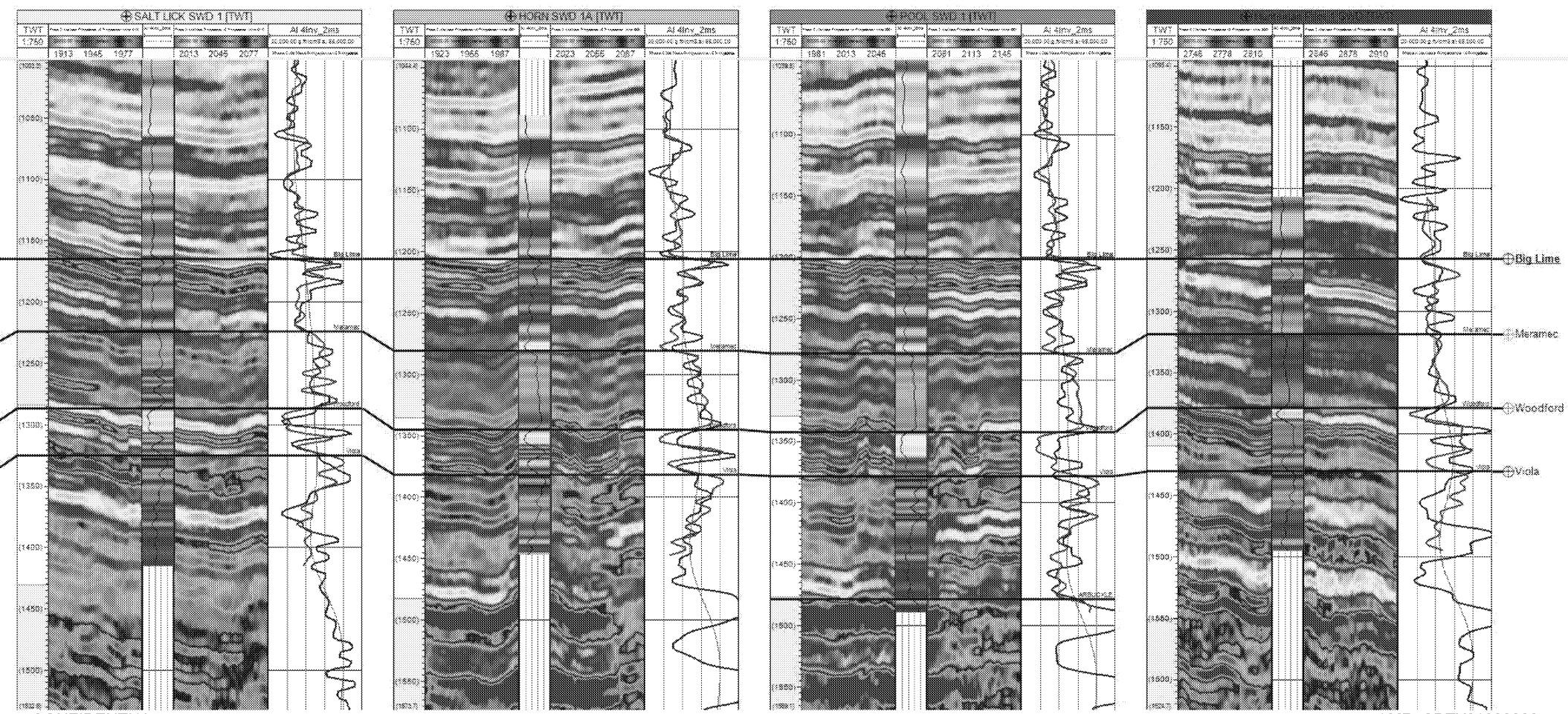
Meramec

Woodford

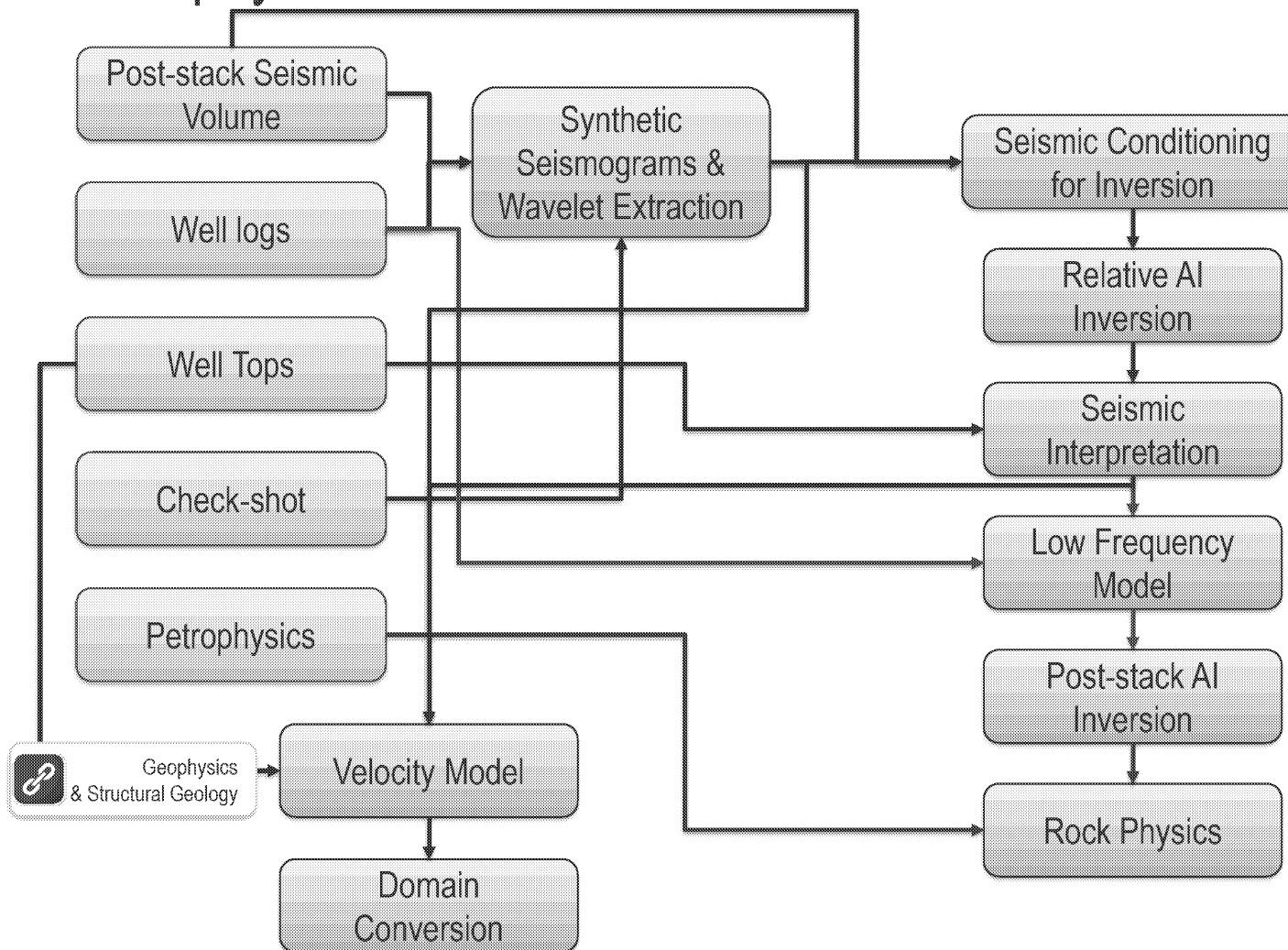
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# Post-stack Acoustic Impedance Inversion QC

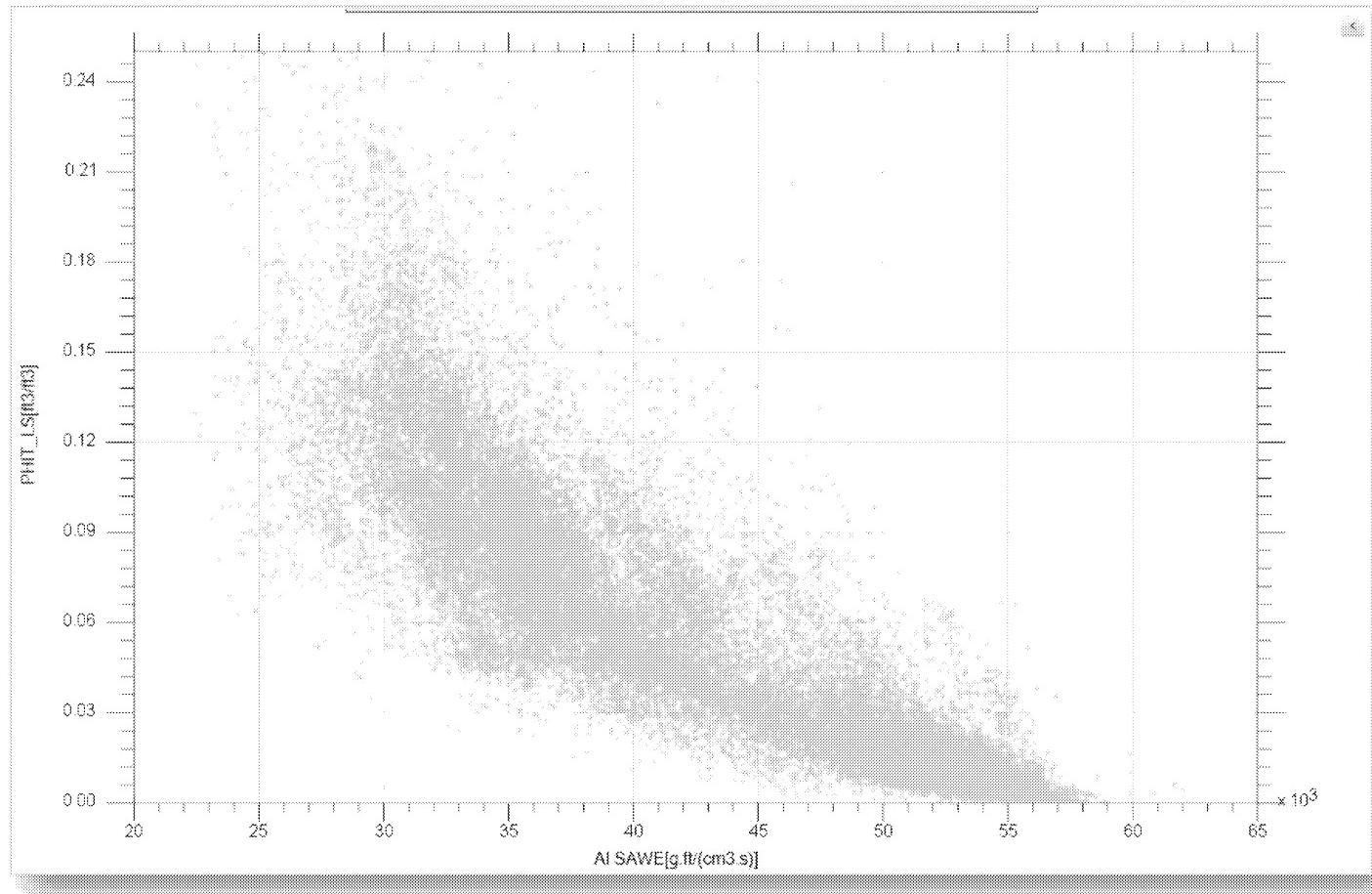


# Geophysics Workflow Overview



# Porosity vs Acoustic Impedance

*Cross-plot at the whole wellbore level – High tier wells*



Correlation coefficient ( $r$ ):

- 0.79

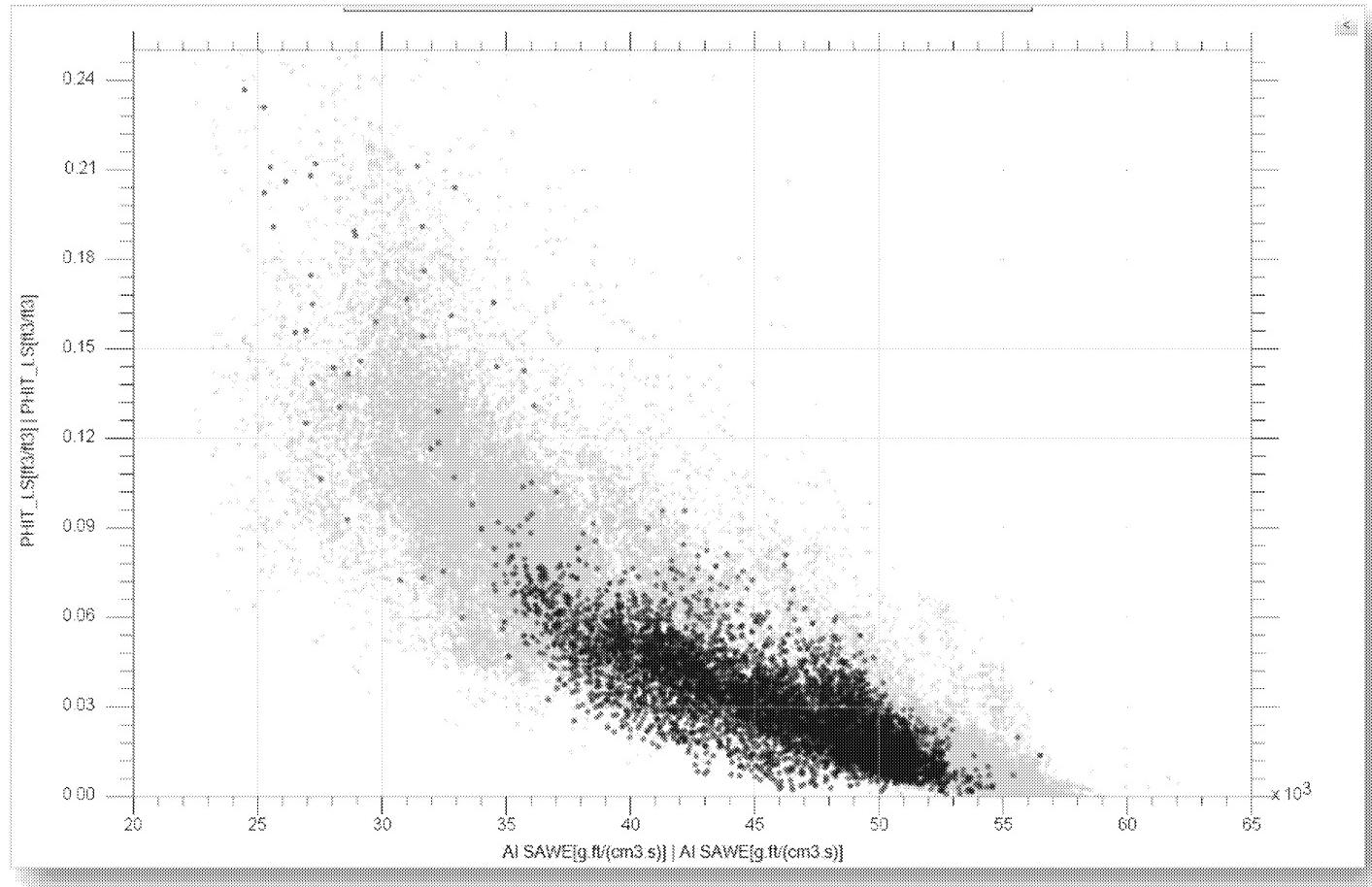
Coefficient of determination ( $r^2$ ):

- 0.63

**Schlumberger**

# Porosity vs Acoustic Impedance

*Cross-plot at the Meramec / Woodford interval – High tier wells*



Correlation coefficient ( $r$ ):

- 0.79

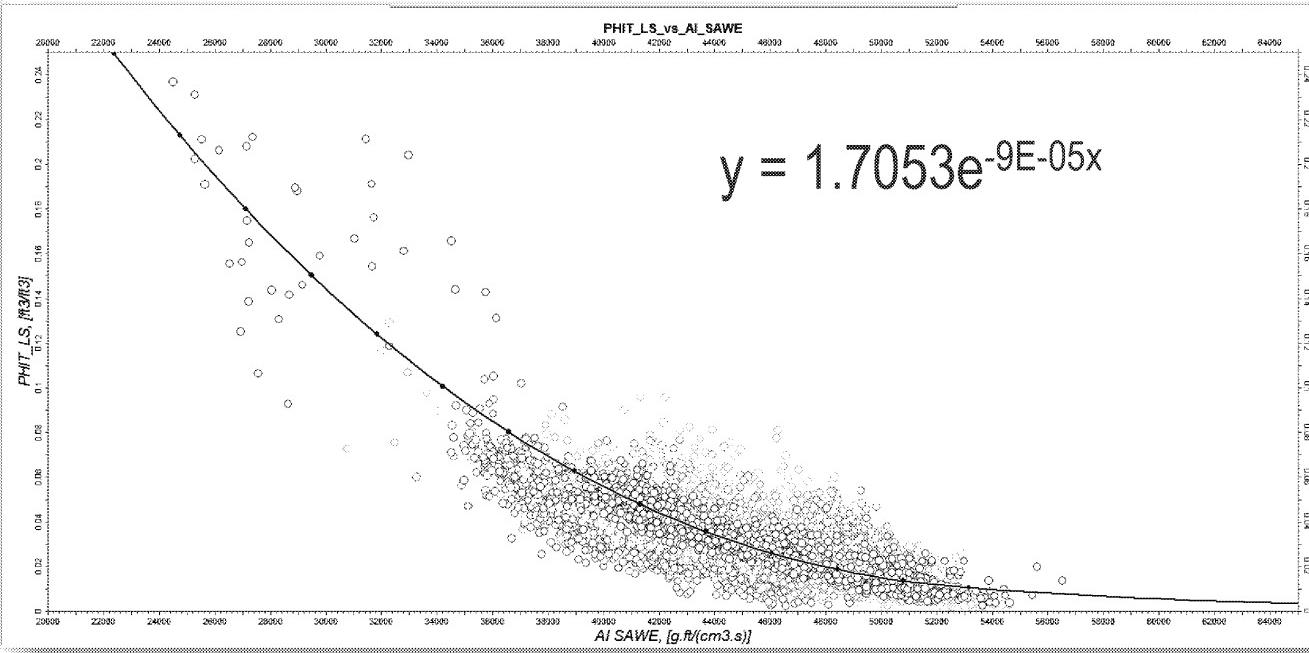
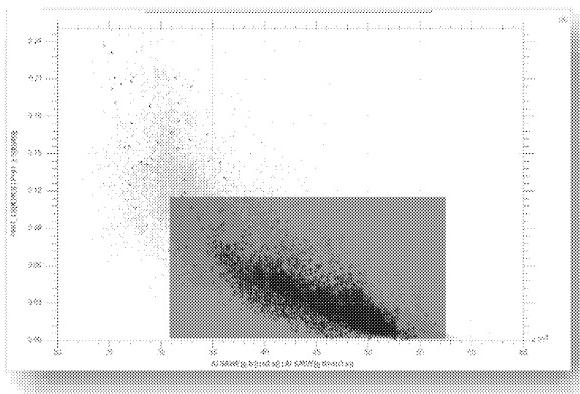
Coefficient of determination ( $r^2$ ):

- 0.63

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# Porosity vs Acoustic Impedance

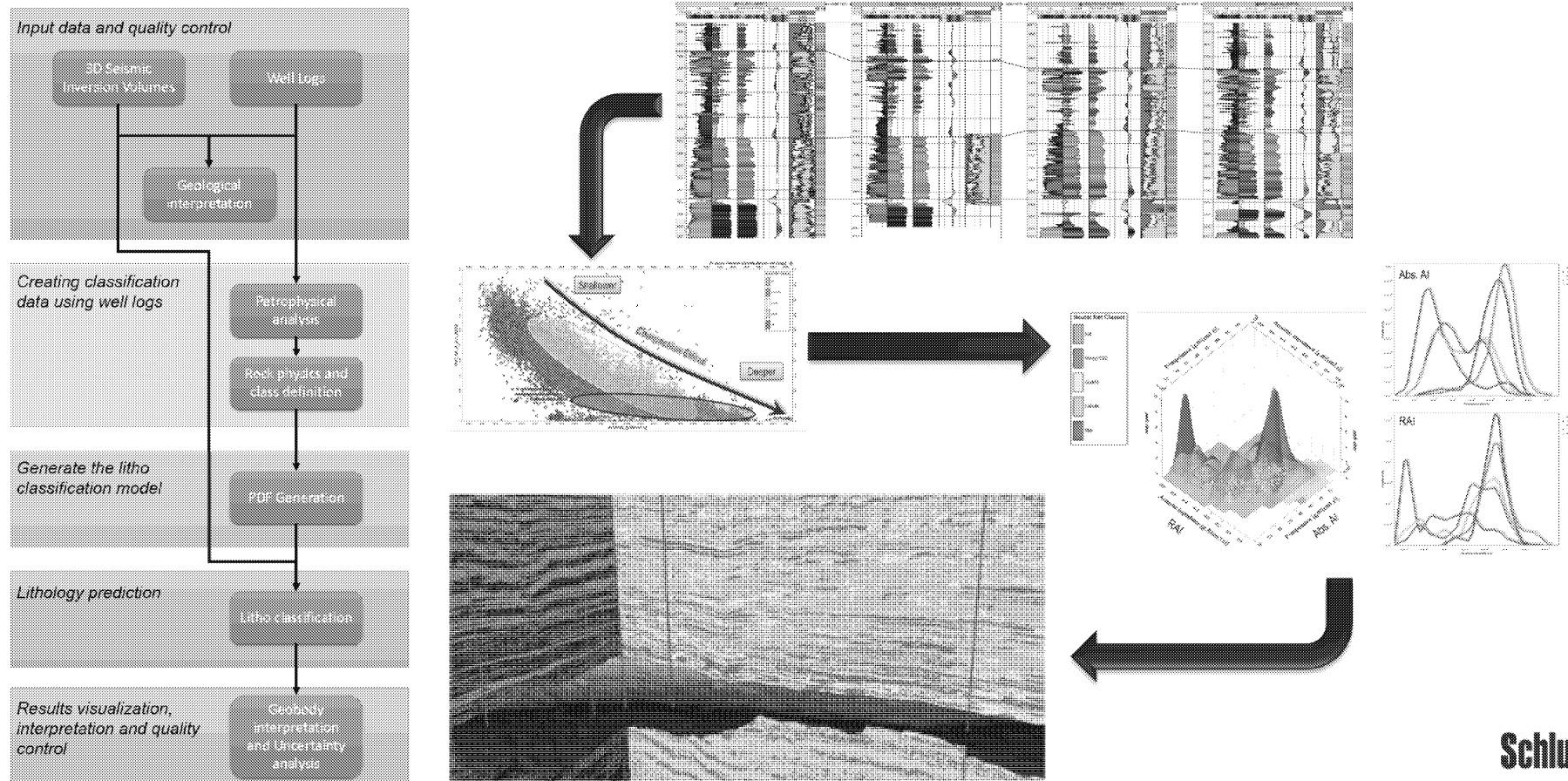
## Cross-plot at the Meramec / Woodford interval – High tier wells



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# Lithology Classification Workflow

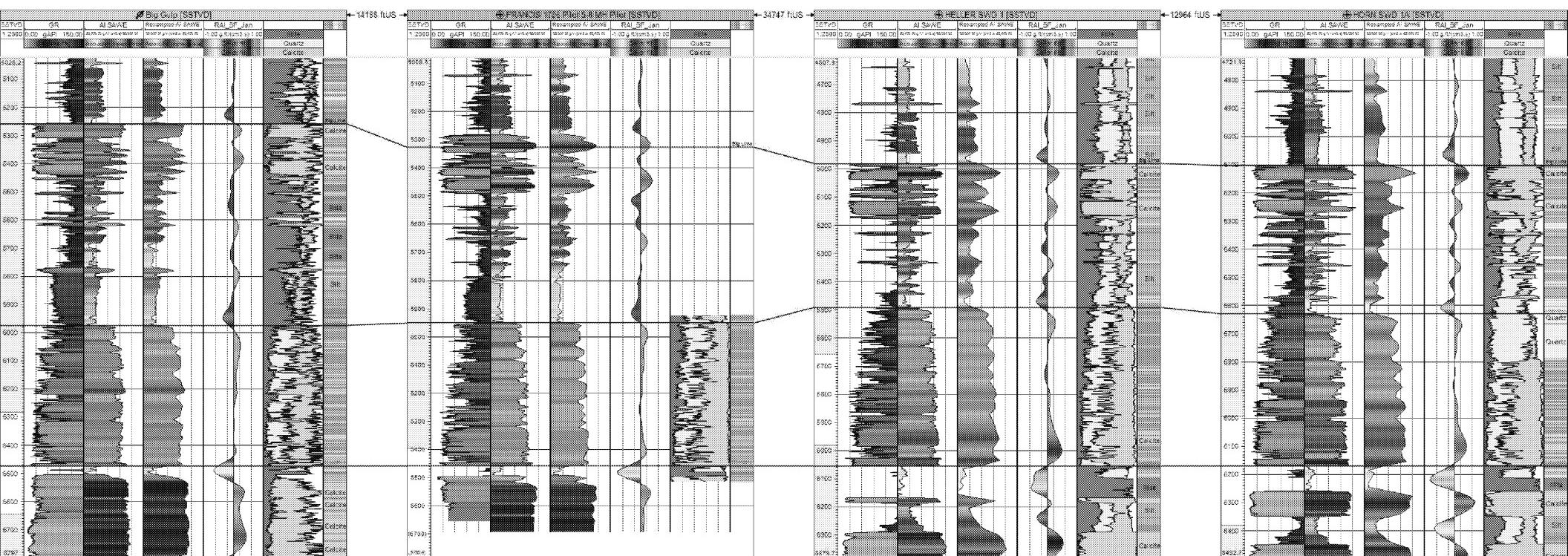
Estimation of the most probable lithology and the uncertainties, by using a Bayesian approach.



**Schlumberger**

# Lithology Classification from Neural Net at Wellbore

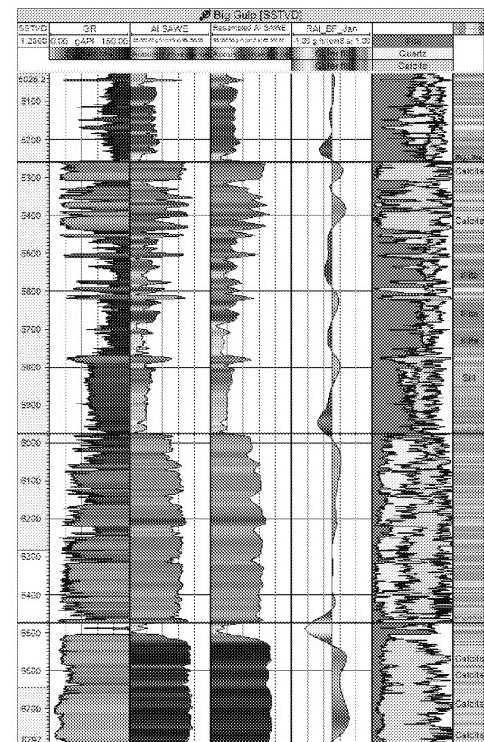
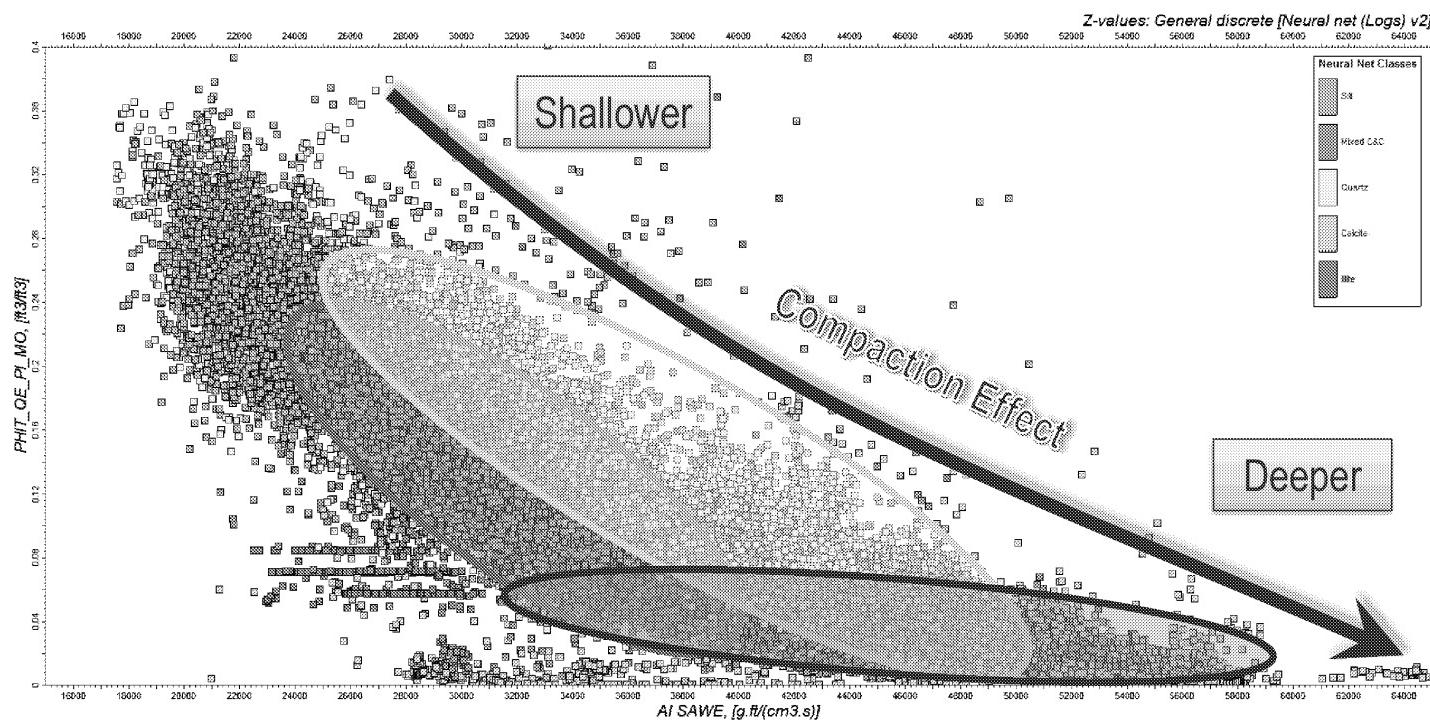
## Big Gulp \ Francis 1706 Pilot\ Heller SWD 1\ Horn SWD 1A



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# AI vs. PHIT at Wellbores, color code Neural Net Classes

## Big Gulp Well (on the right just used as visual reference)



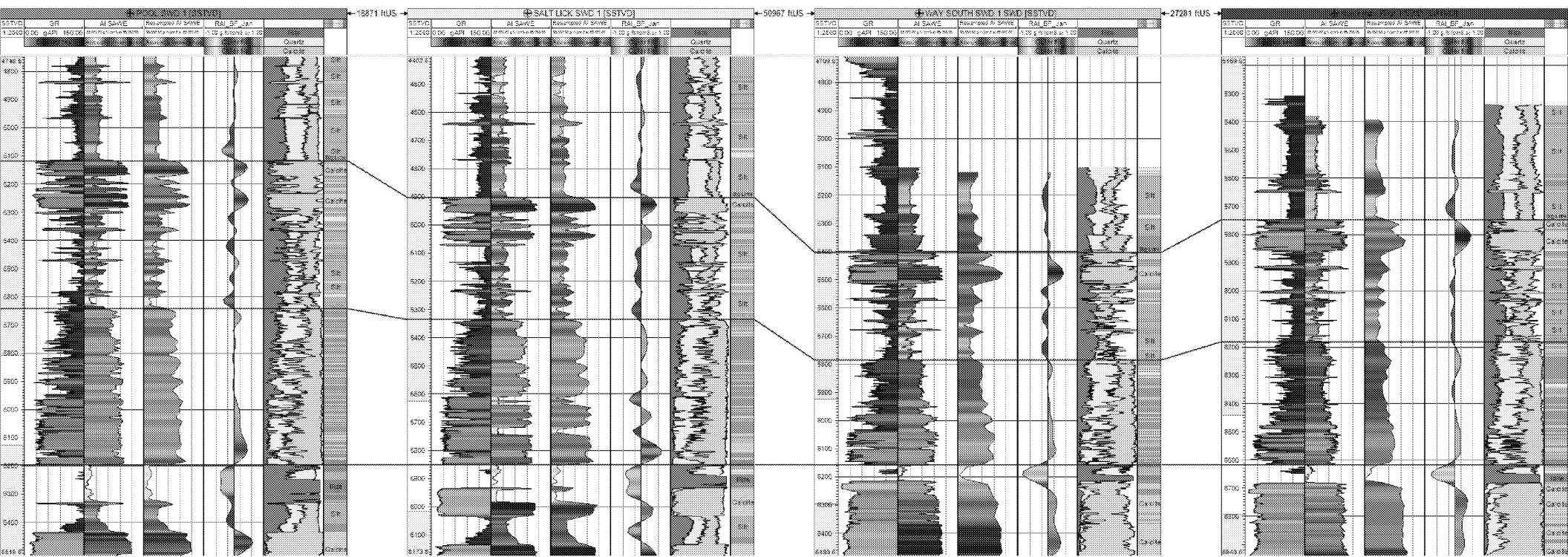
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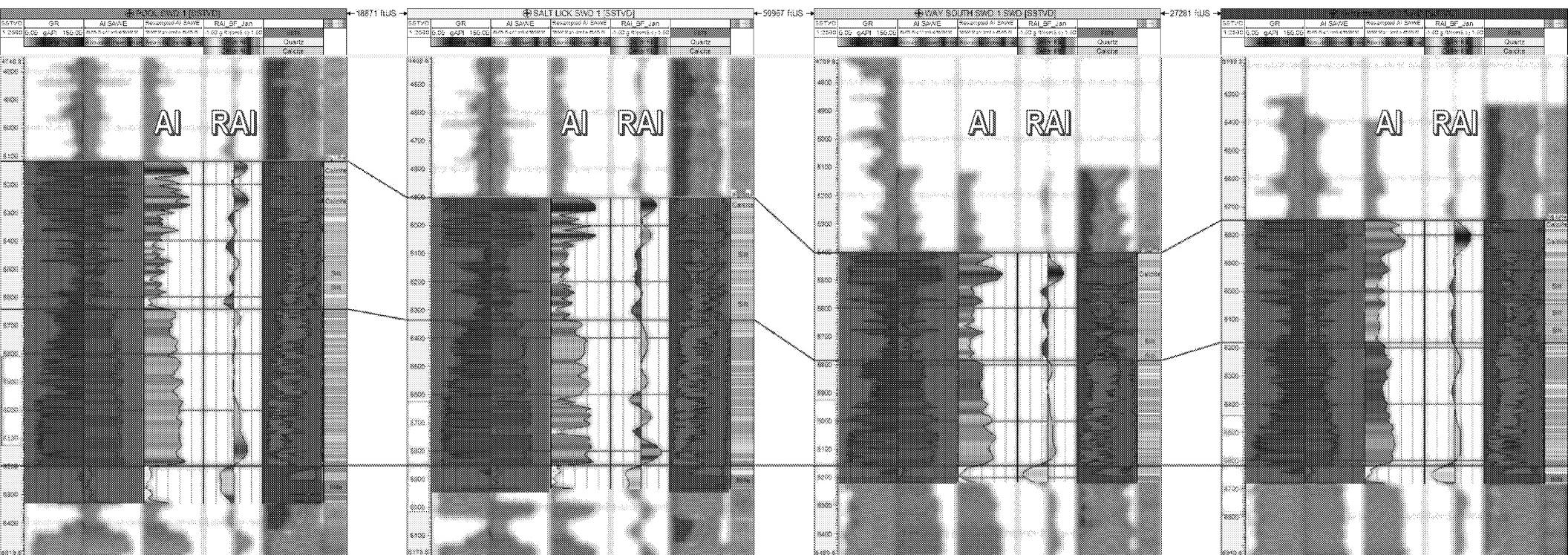
# Lithology Classification from Neural Net at Wellbore

## Pool SWD 1\ Salt Lick SWD 1 \ Way South SWD 1\ Huntsman Pilot



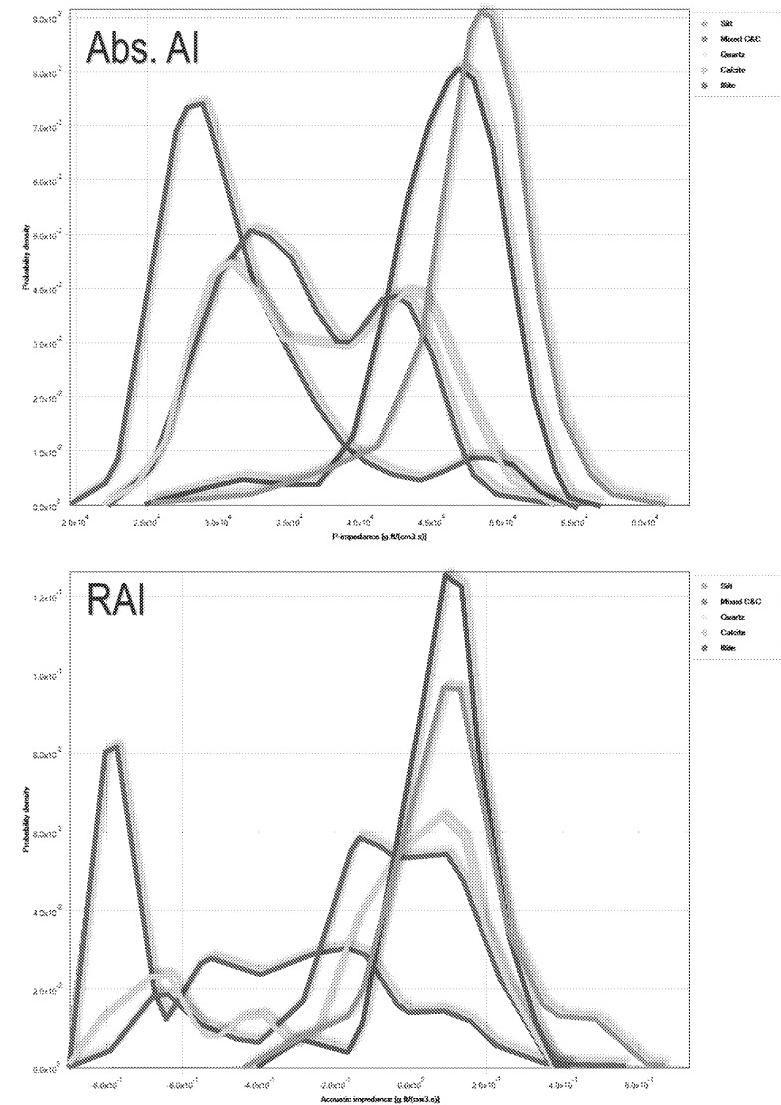
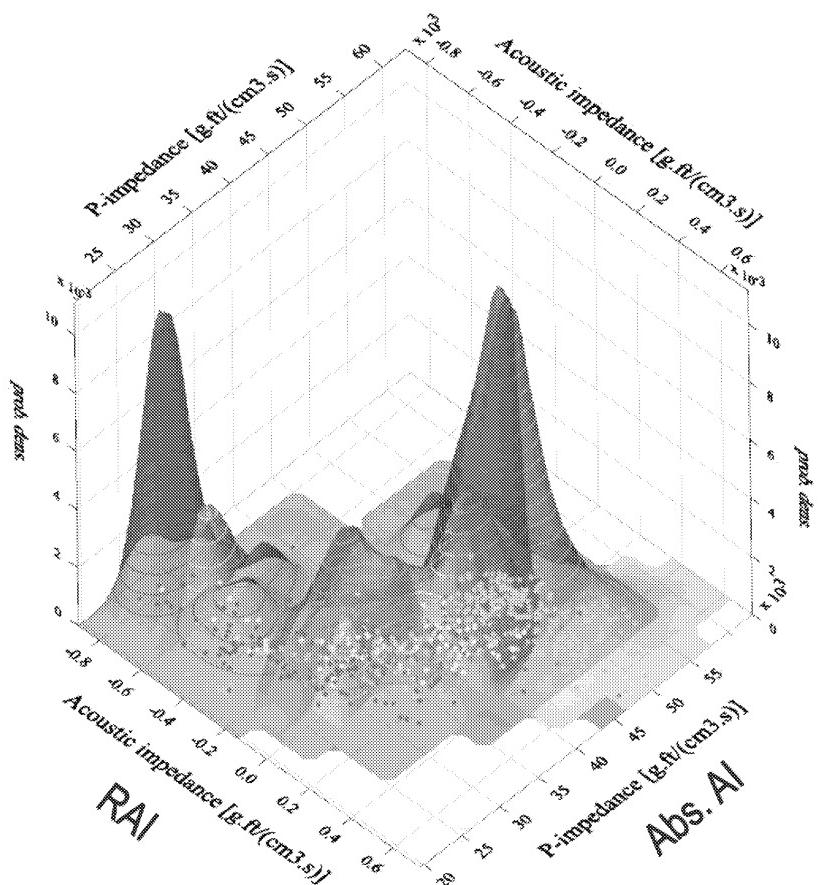
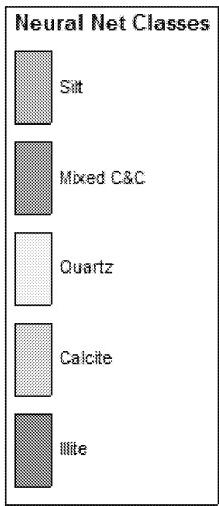
**Schlumberger**

# Lithology Classification from Neural Net at Wellbore (Big Lime to Hunton) Pool SWD 1\ Salt Lick SWD 1 \ Way South SWD 1\ Huntsman Pilot



**Schlumberger**

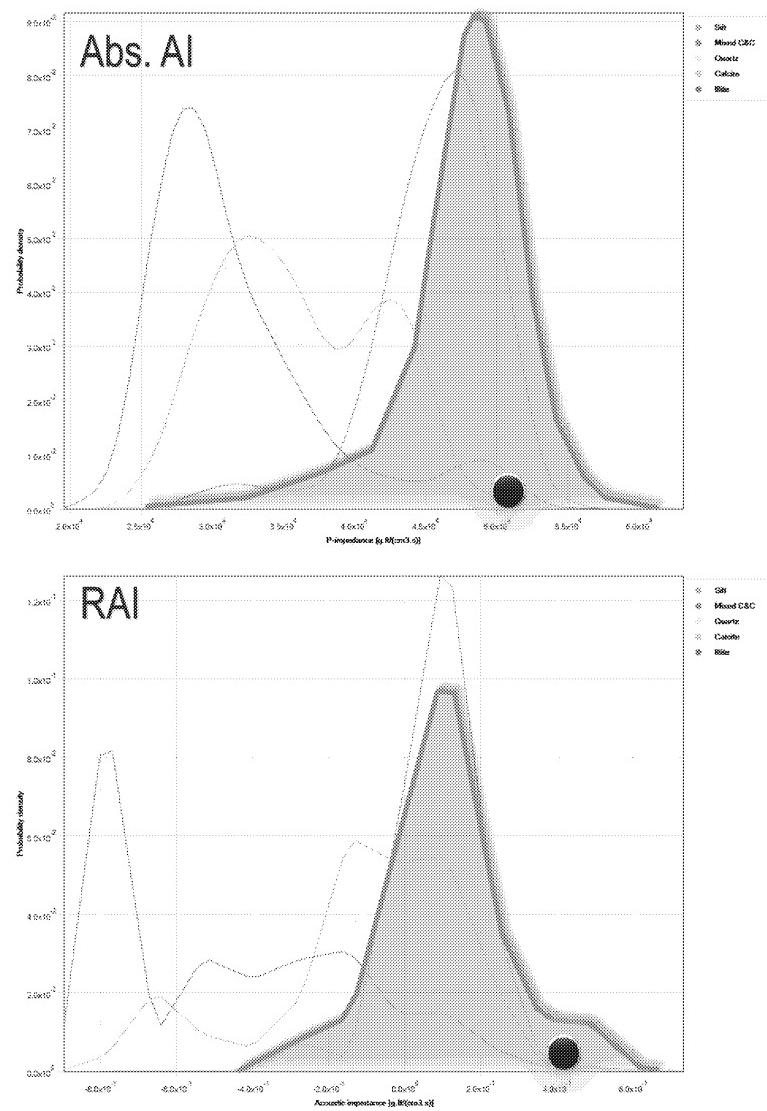
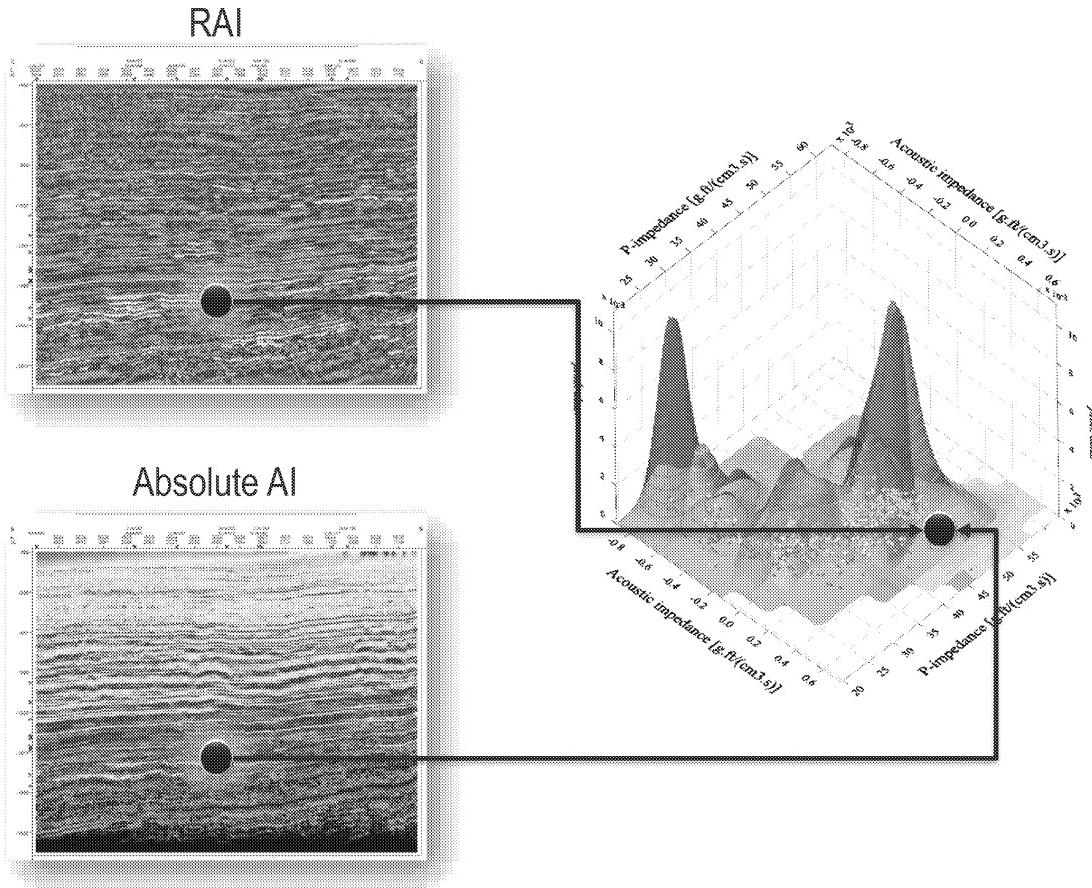
# AI vs. RAI at Wellbores, All Discrete classes Probability Density Functions (PDFs)



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# Lithology Prediction



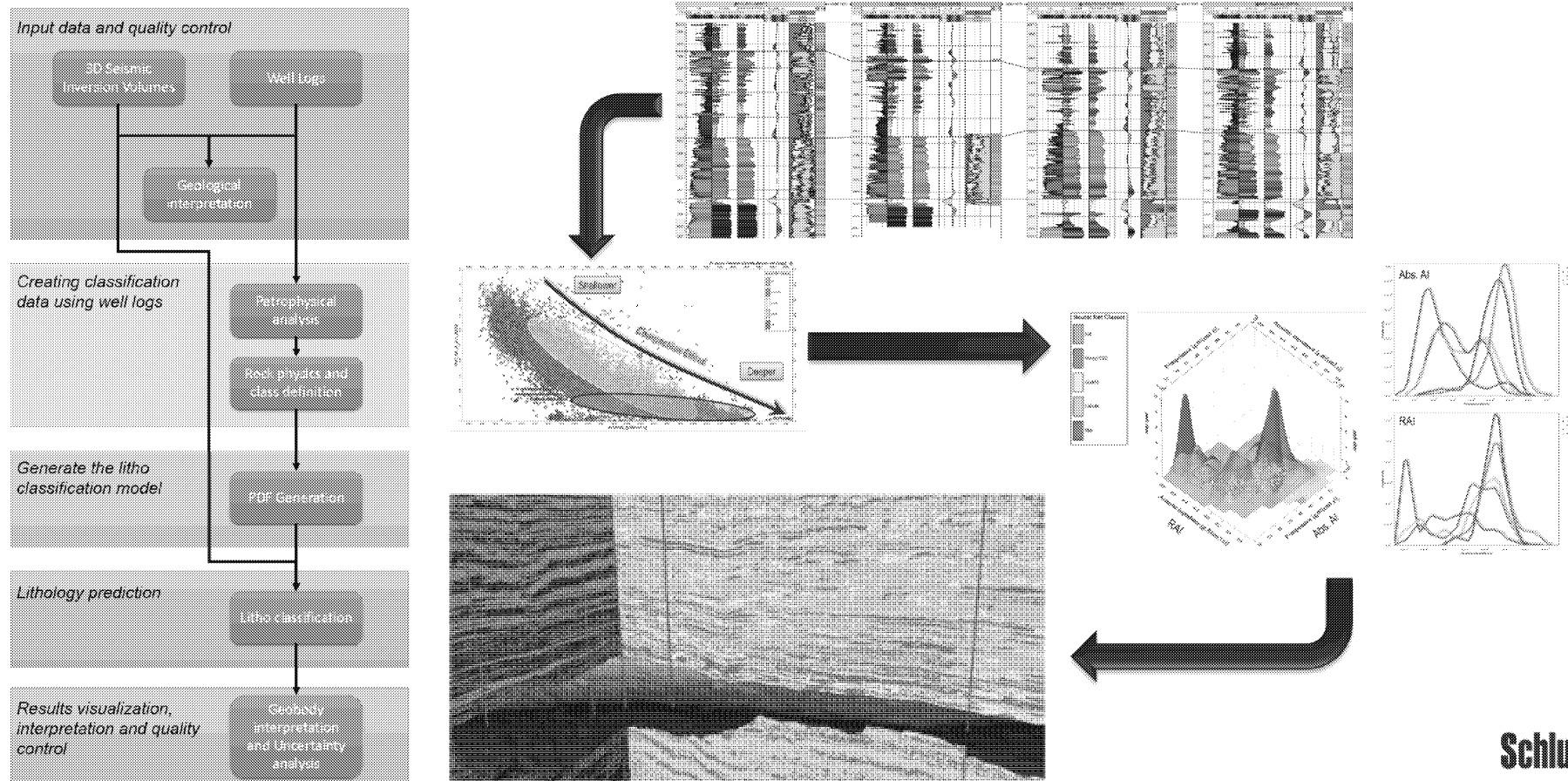
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# Lithology Classification Workflow

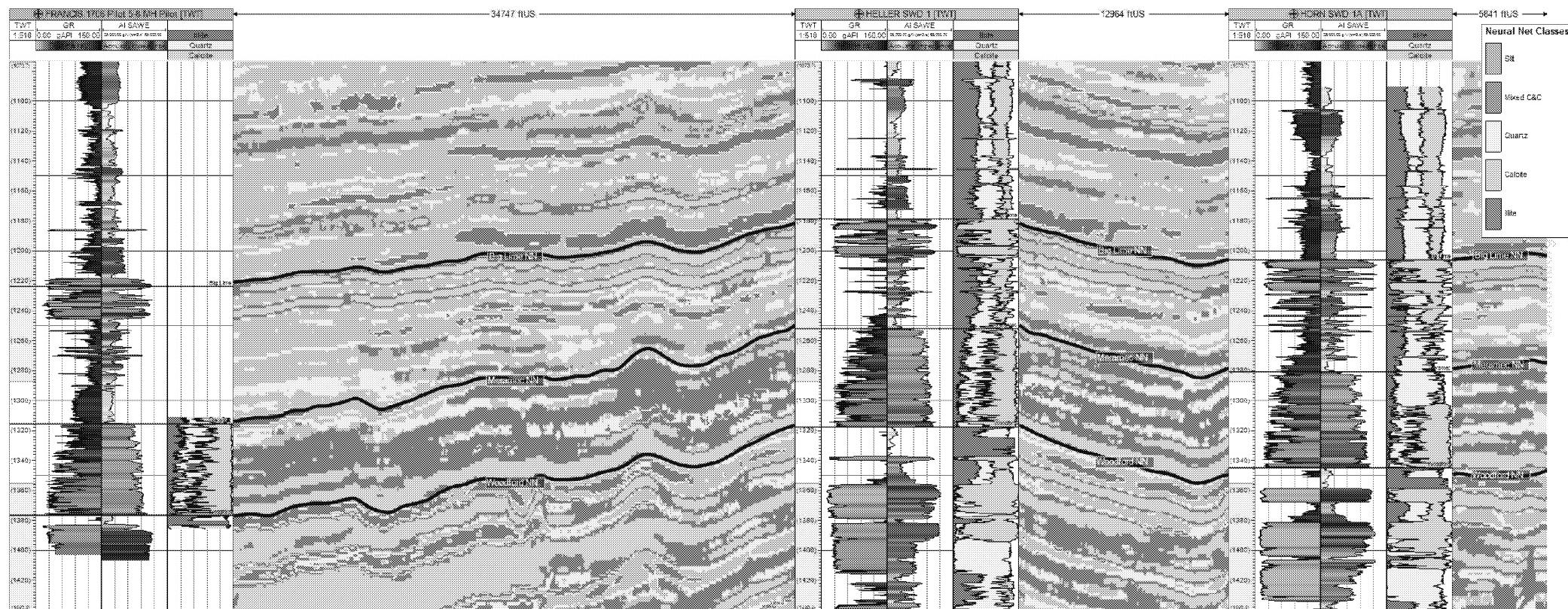
Estimation of the most probable lithology and the uncertainties, by using a Bayesian approach.



**Schlumberger**

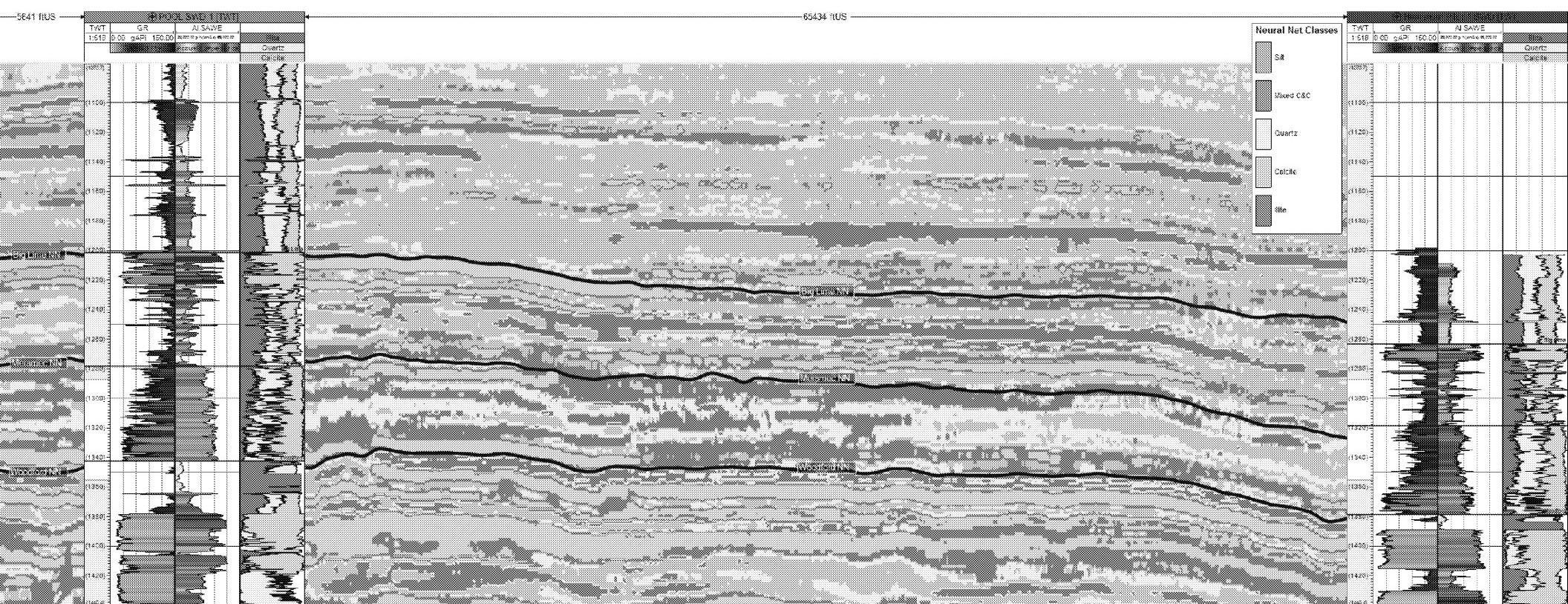
# Lithology Classification Interval Big Lime - Woodford

## Francis 1706 Pilot\ Heller SWD 1\ Horn SWD 1A



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# Lithology Classification Interval Big Lime – Woodford Pool SWD 1 \ Huntsman Pilot

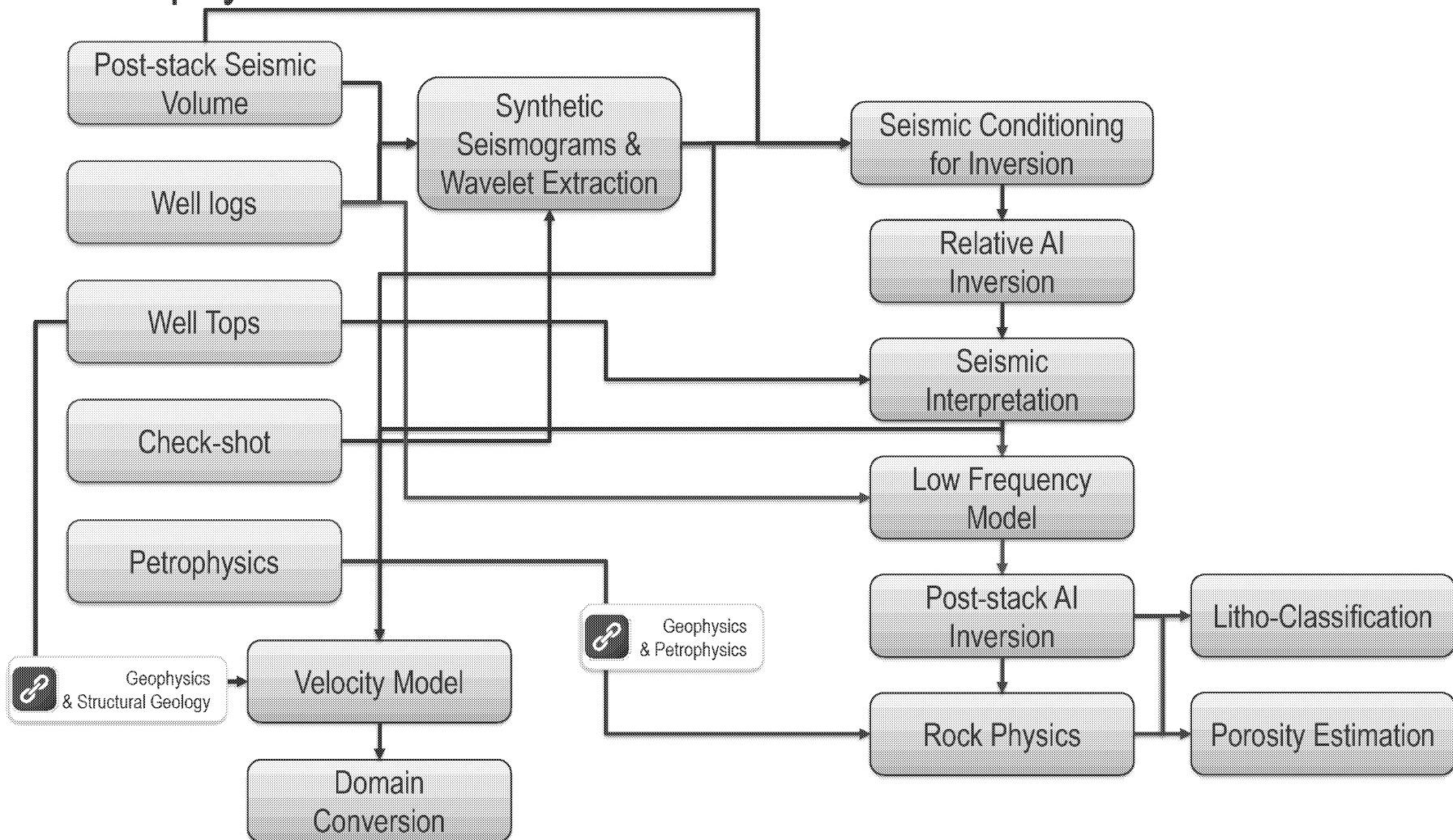


Schlumberger

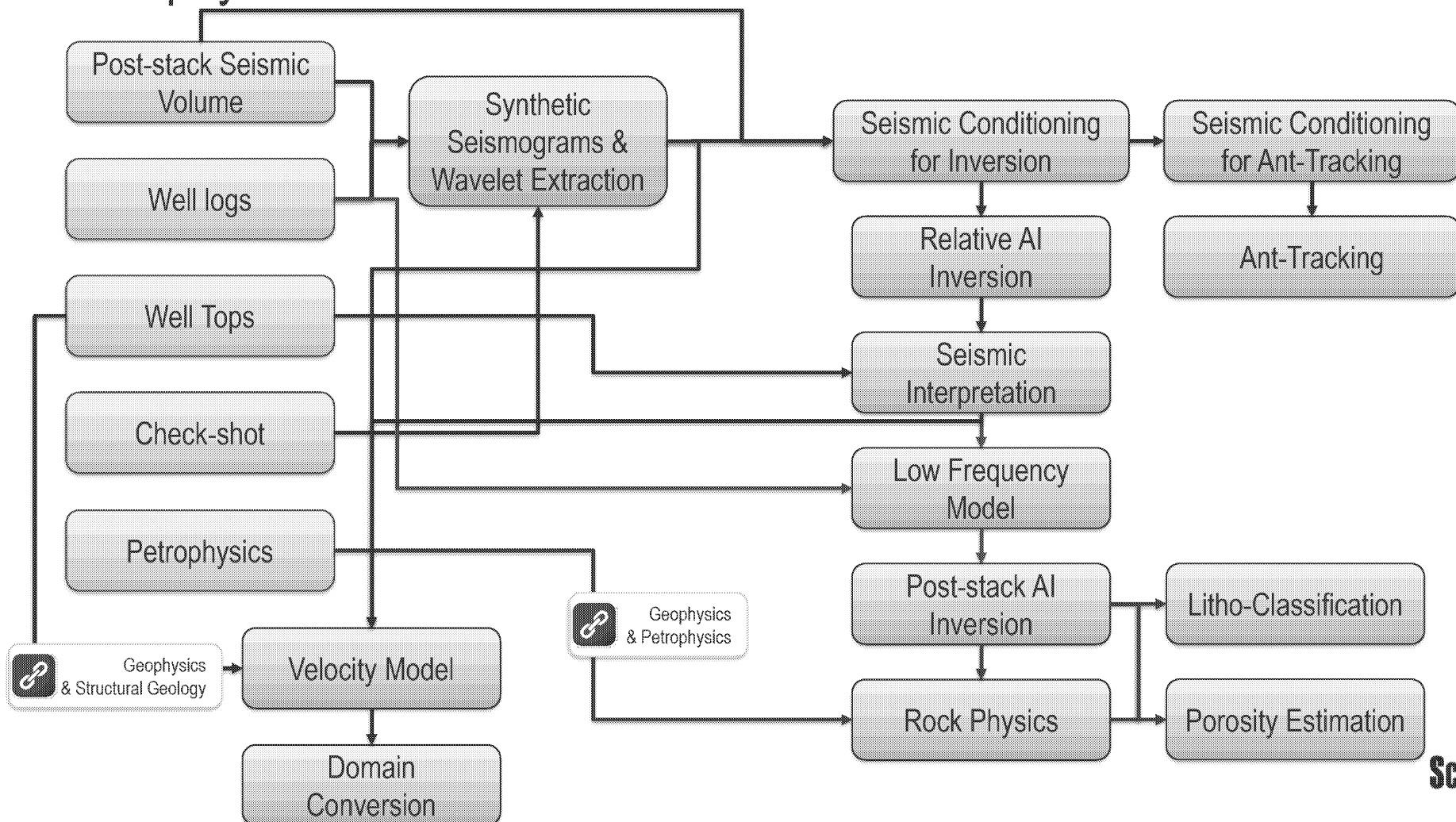
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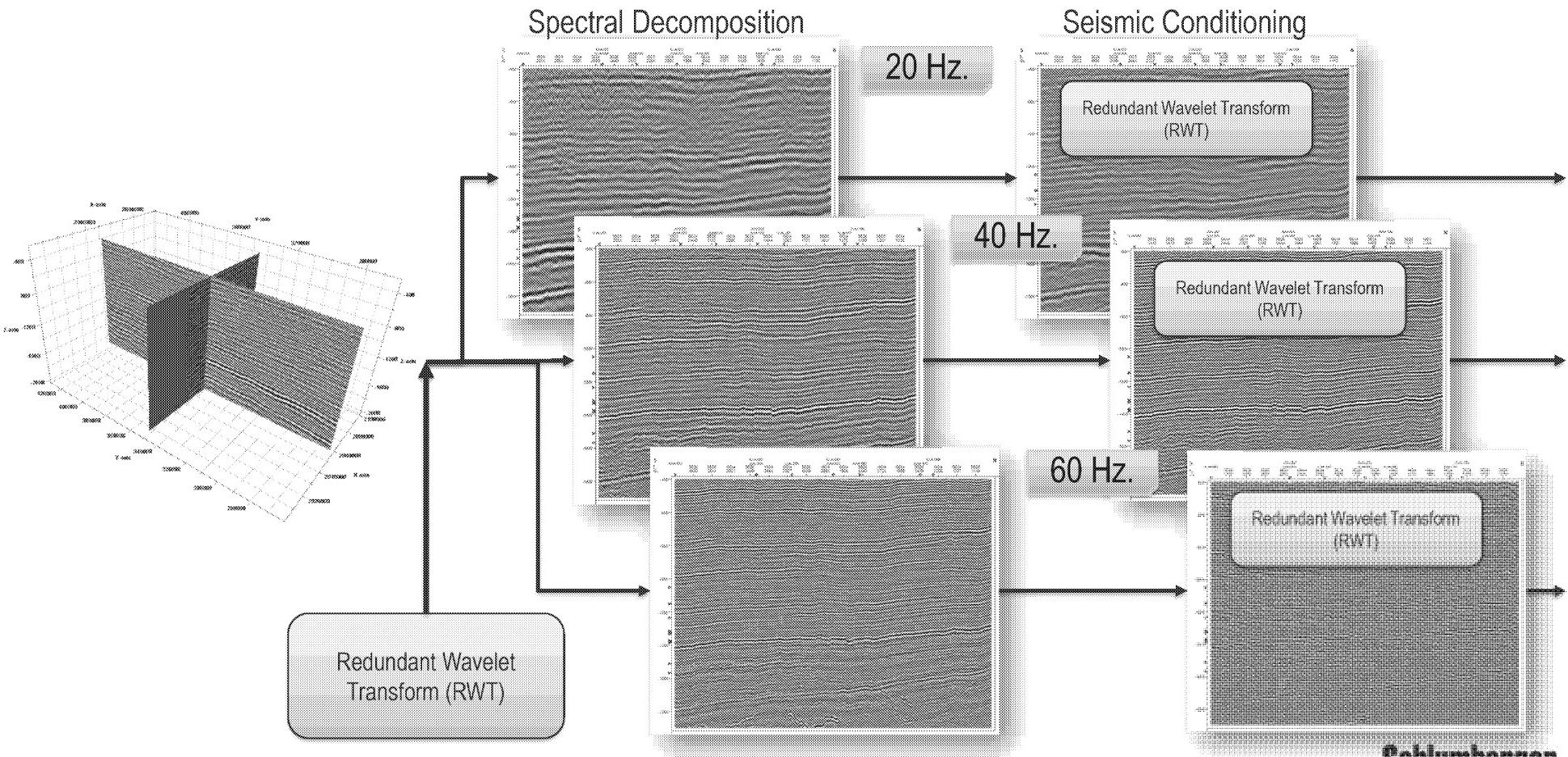
# Geophysics Workflow Overview



# Geophysics Workflow Overview



## Ant-tracking Workflow Applied



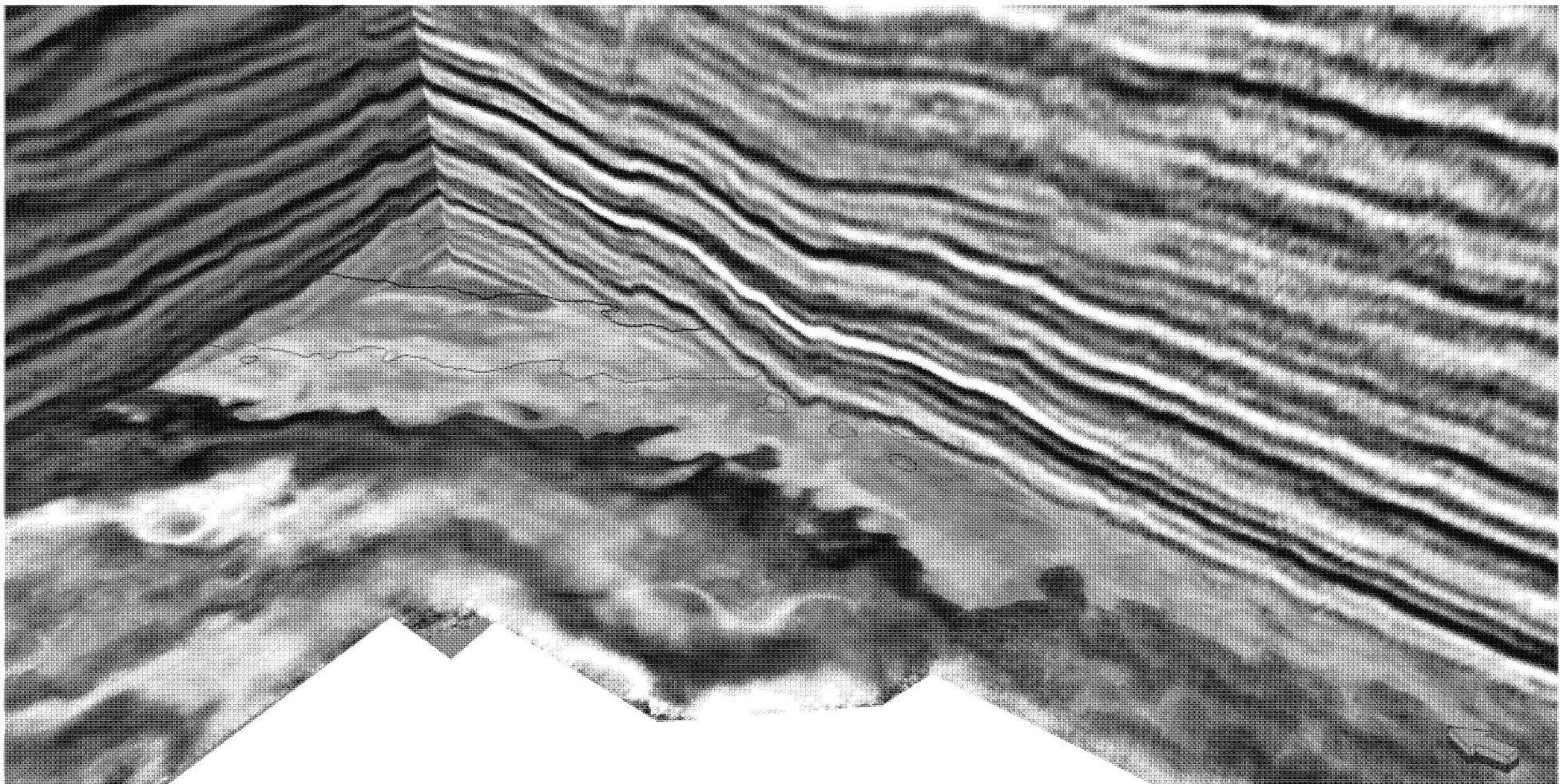
References: *Improving Reservoir Characterization with Seismic Data Preconditioning*  
Saleh Al-Dossary (Saudi Aramco)

**Schlumberger**

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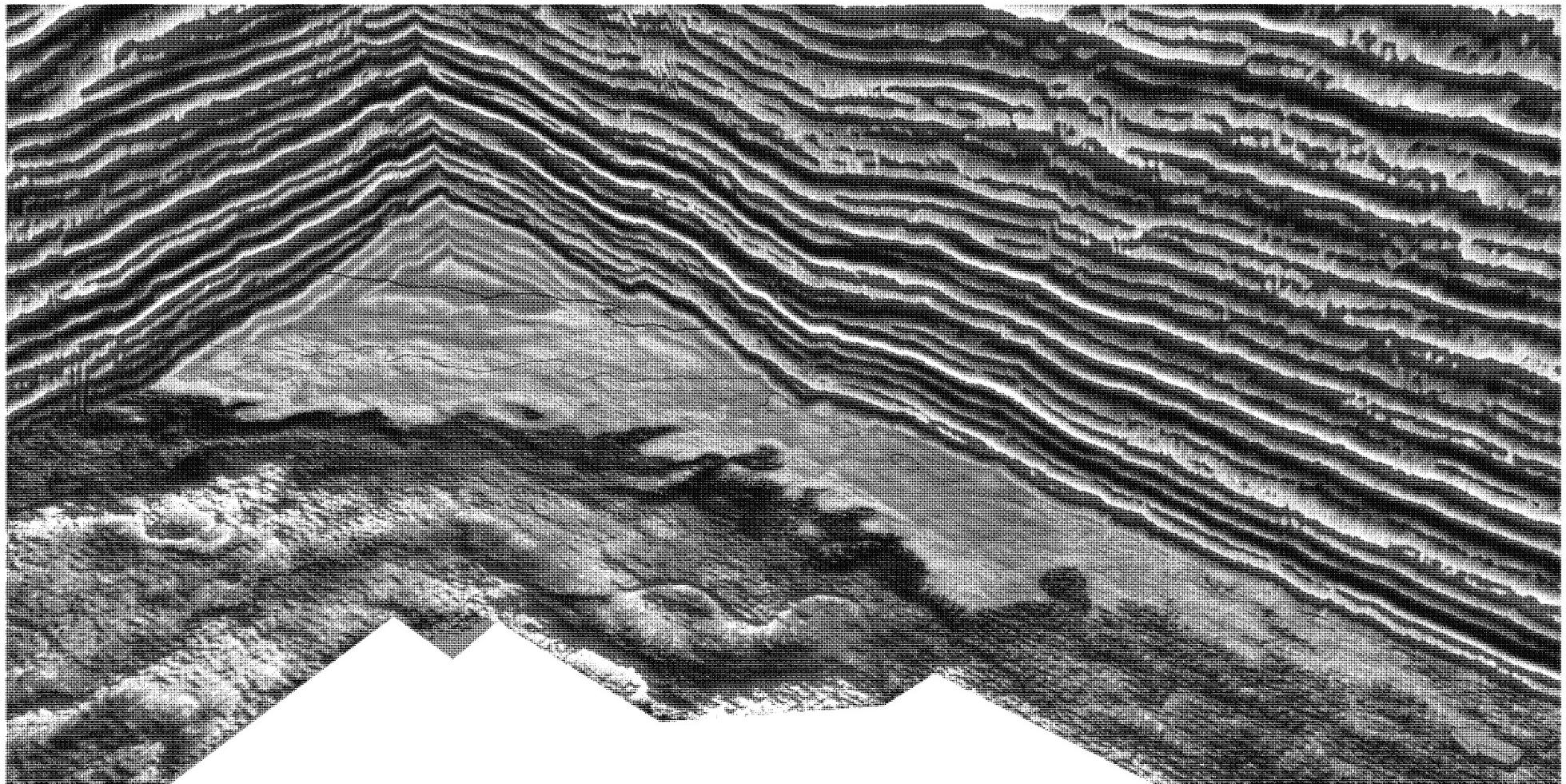
## Post-stack before RWT



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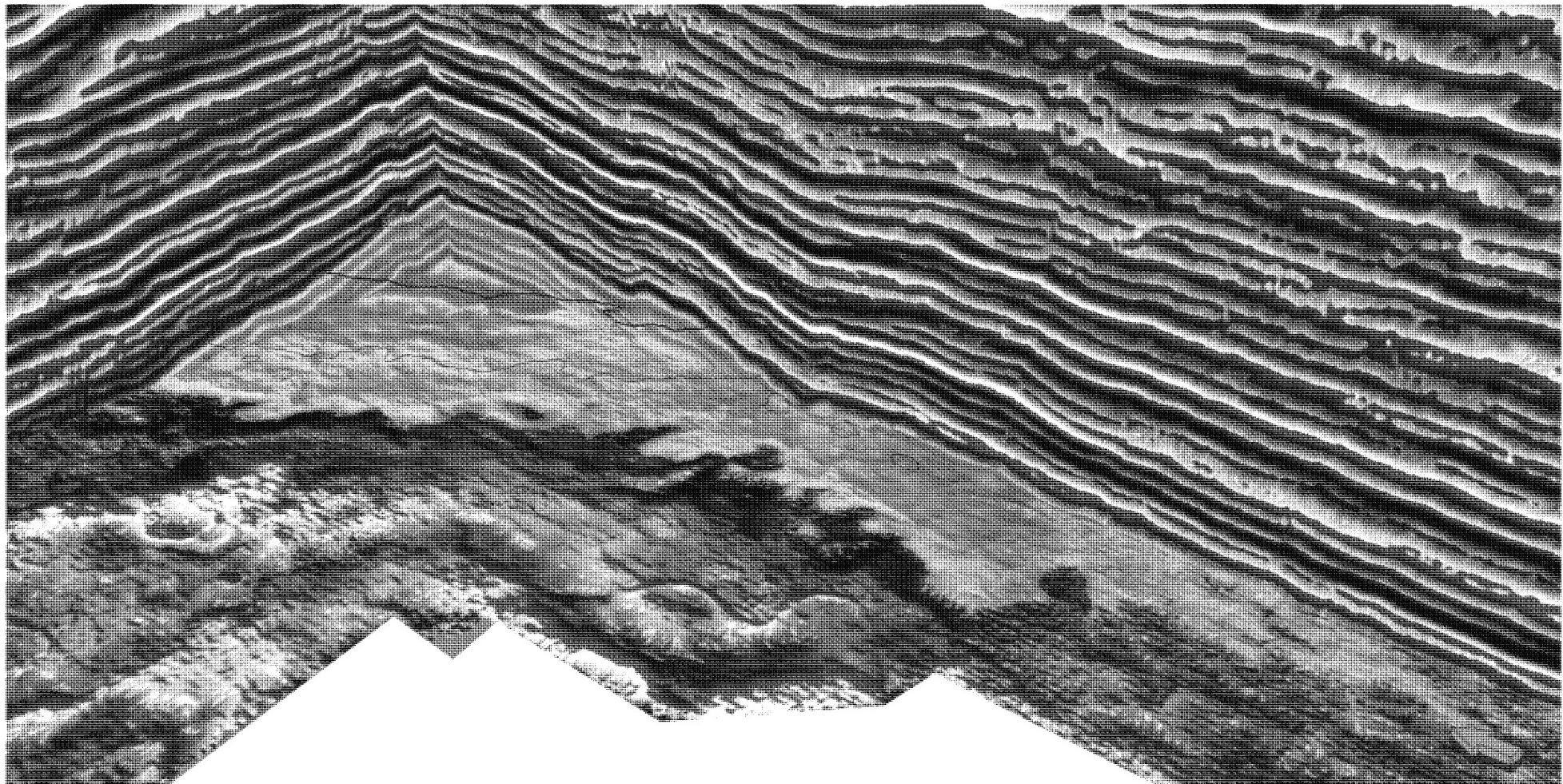
## Post-stack before RWT



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## Post-stack after RWT



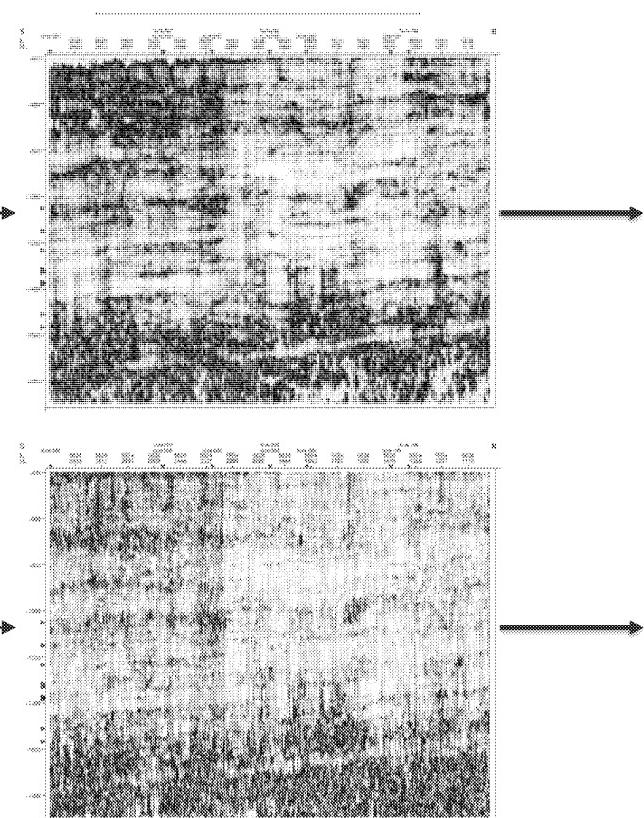
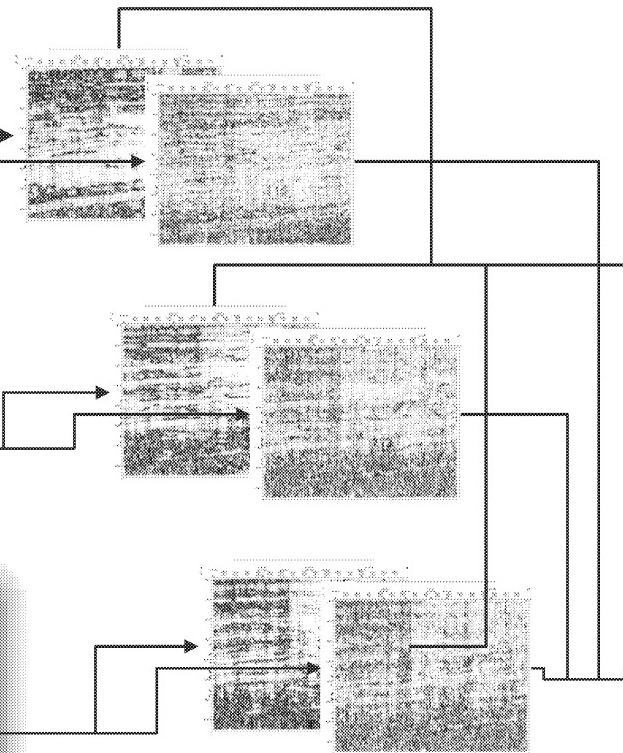
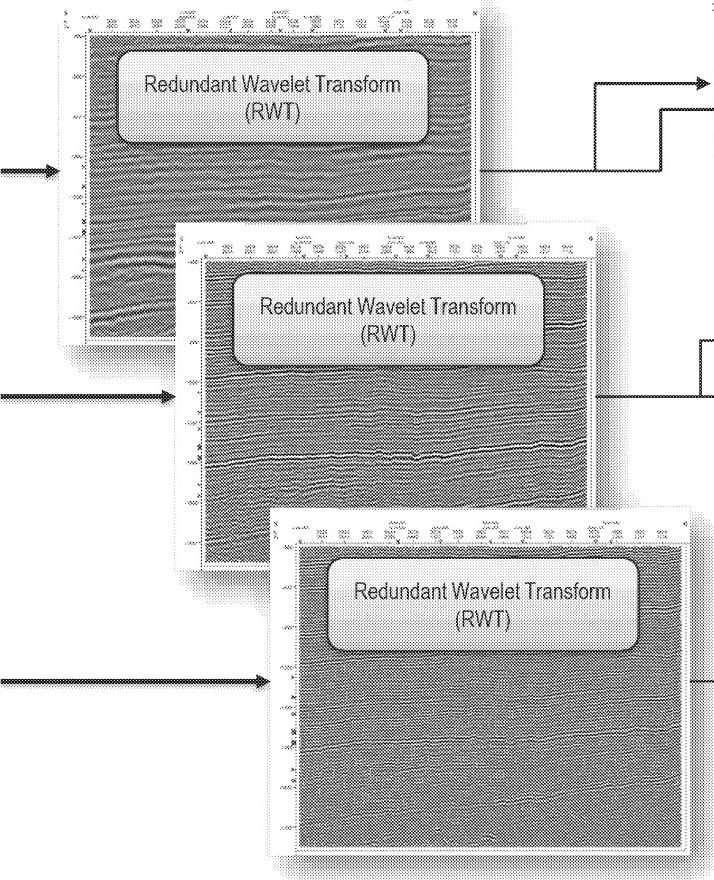
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## Ant-tracking Workflow Applied

### Edge Detection

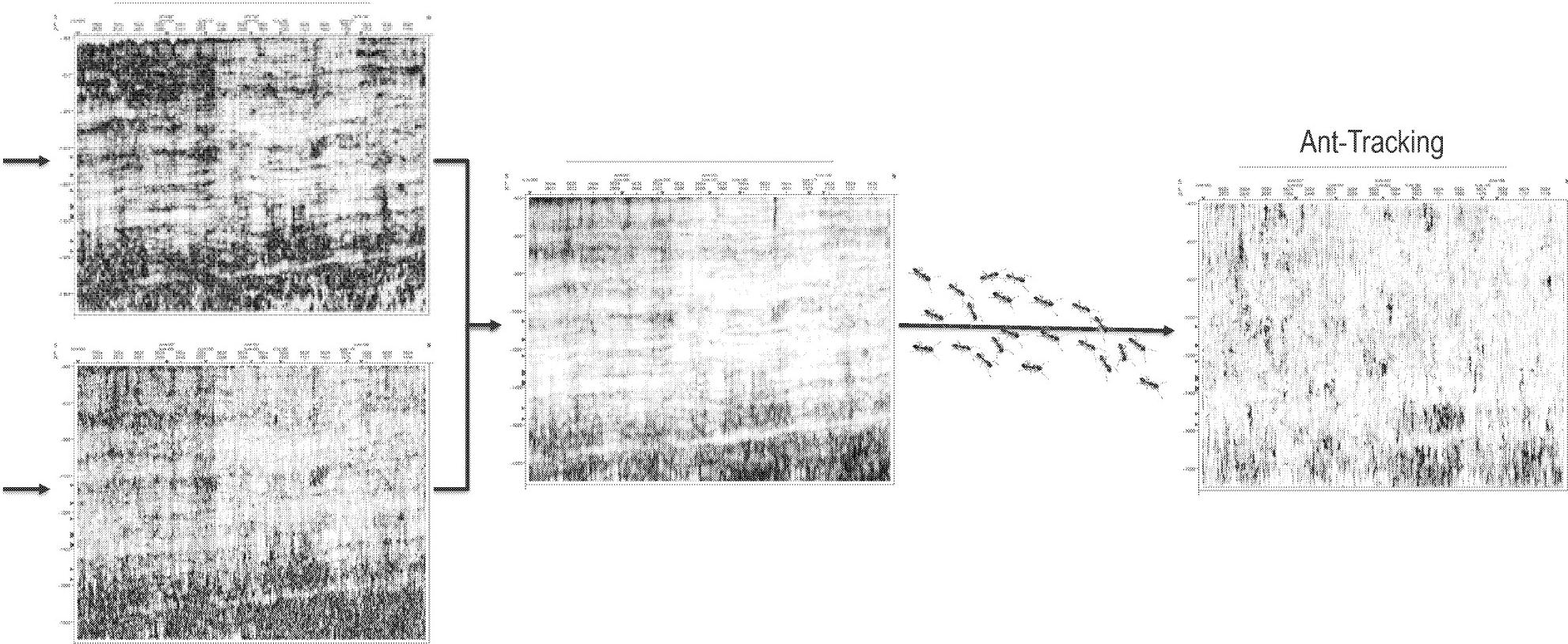
#### Seismic Conditioning



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## Ant-tracking Workflow Applied

Edge Detection



**Schlumberger**

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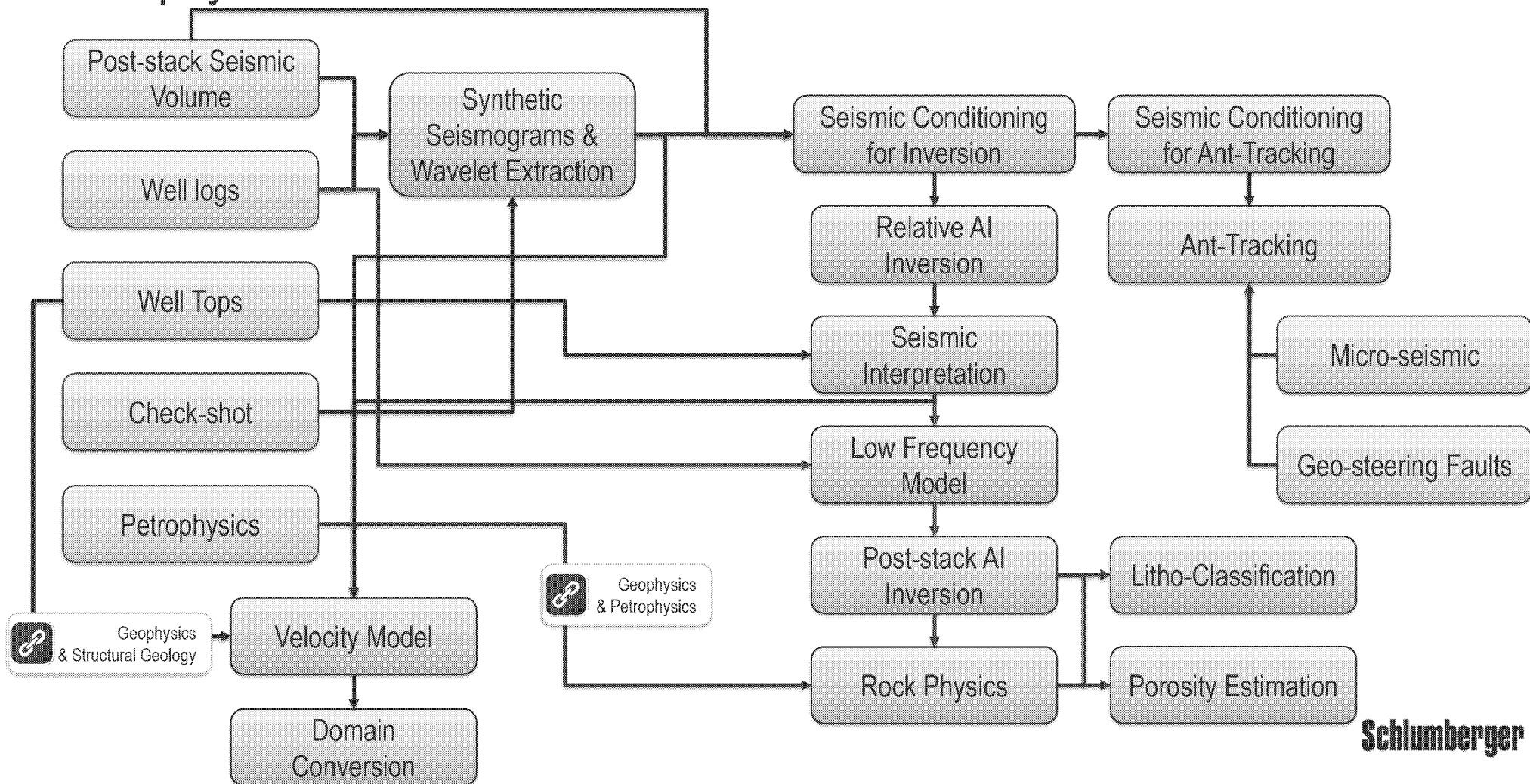
## Ant-Tracking after RWT



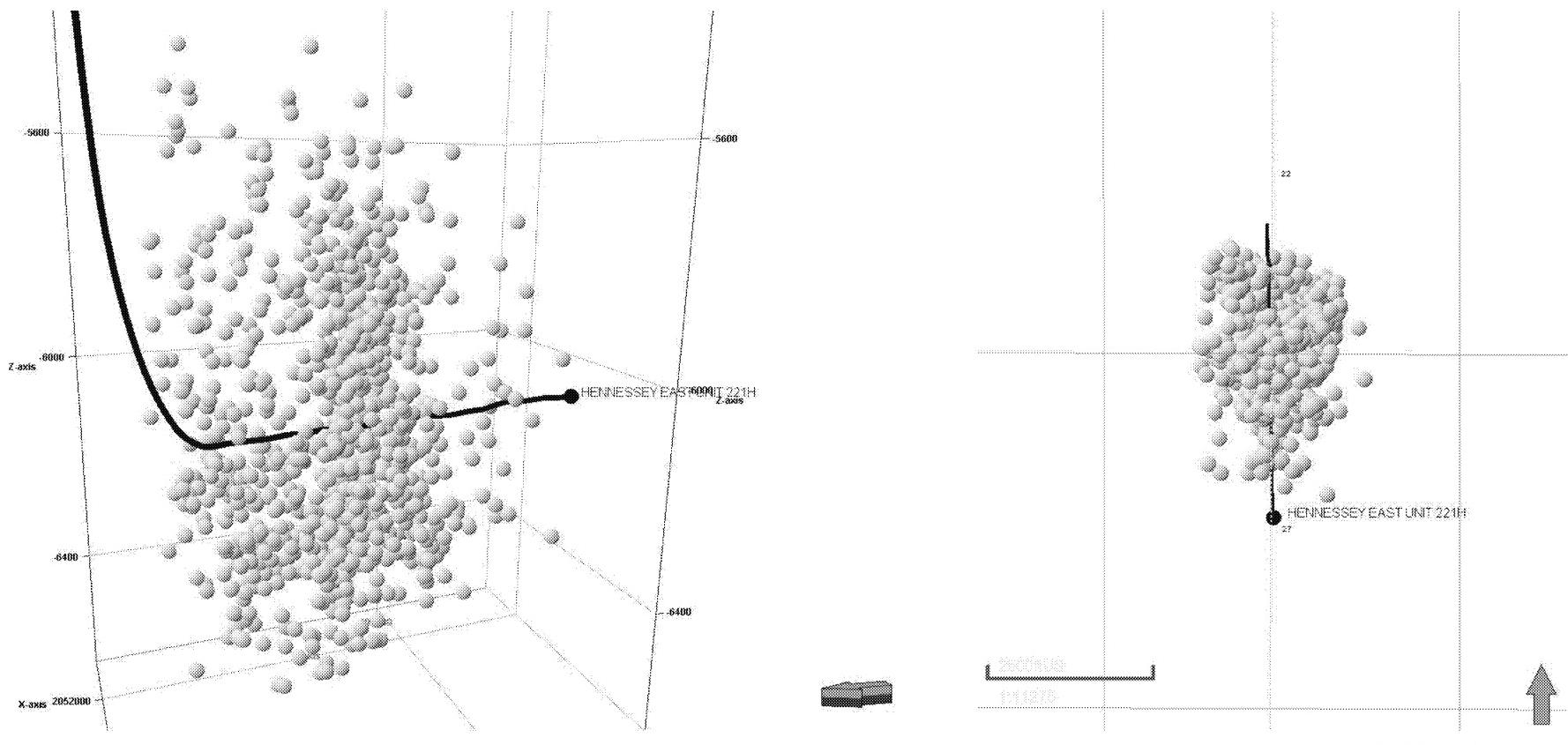
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# Geophysics Workflow Overview

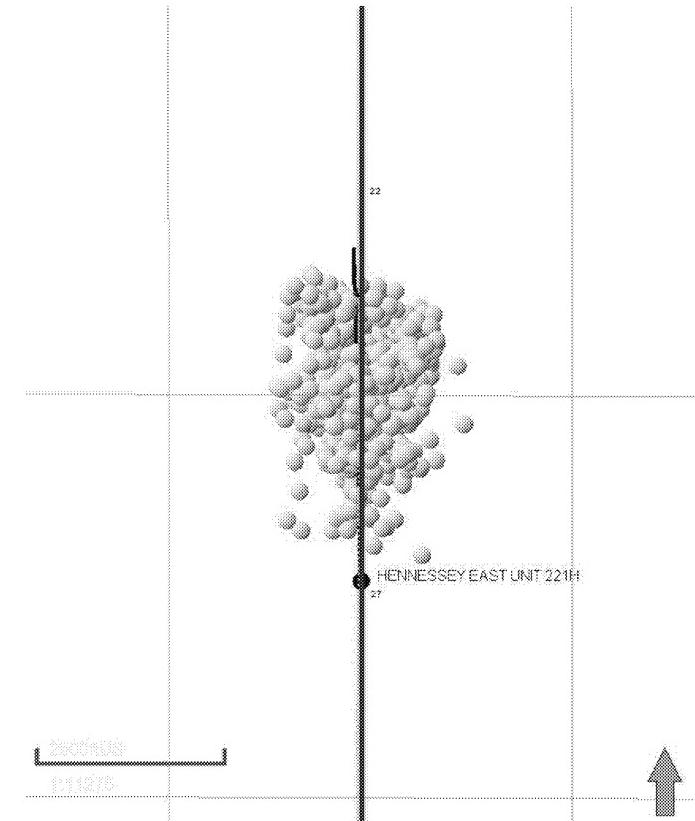
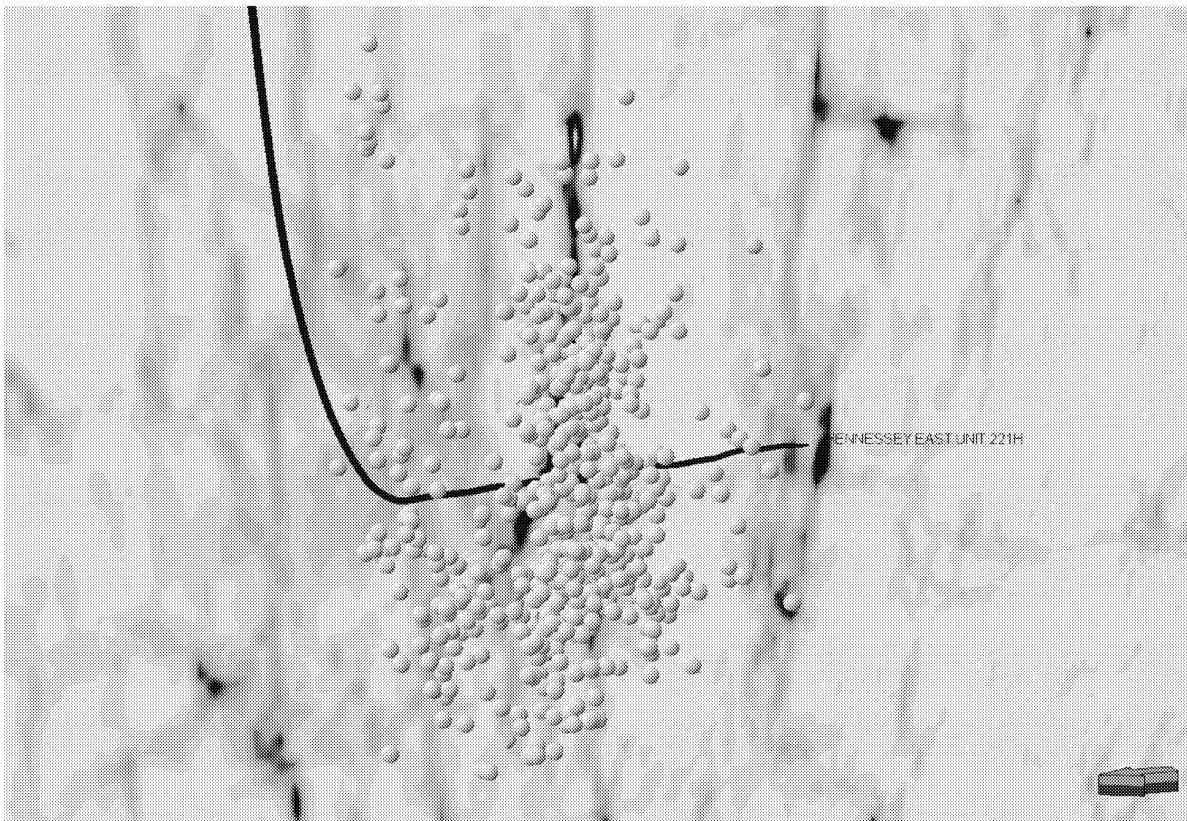


## Ant-Tracking calibration against Micro-seismic Well EHU-221H & Micro-seismic events (all stages)



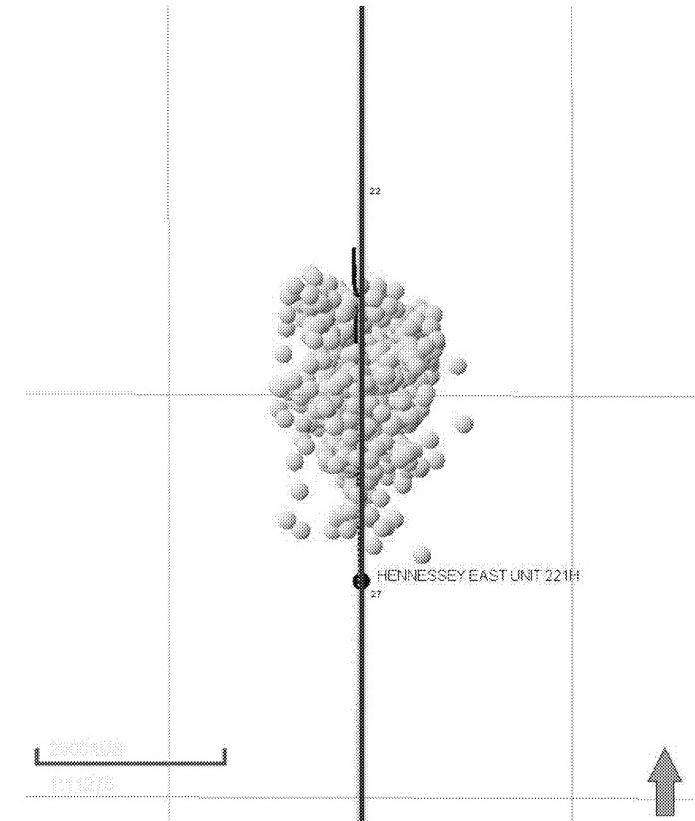
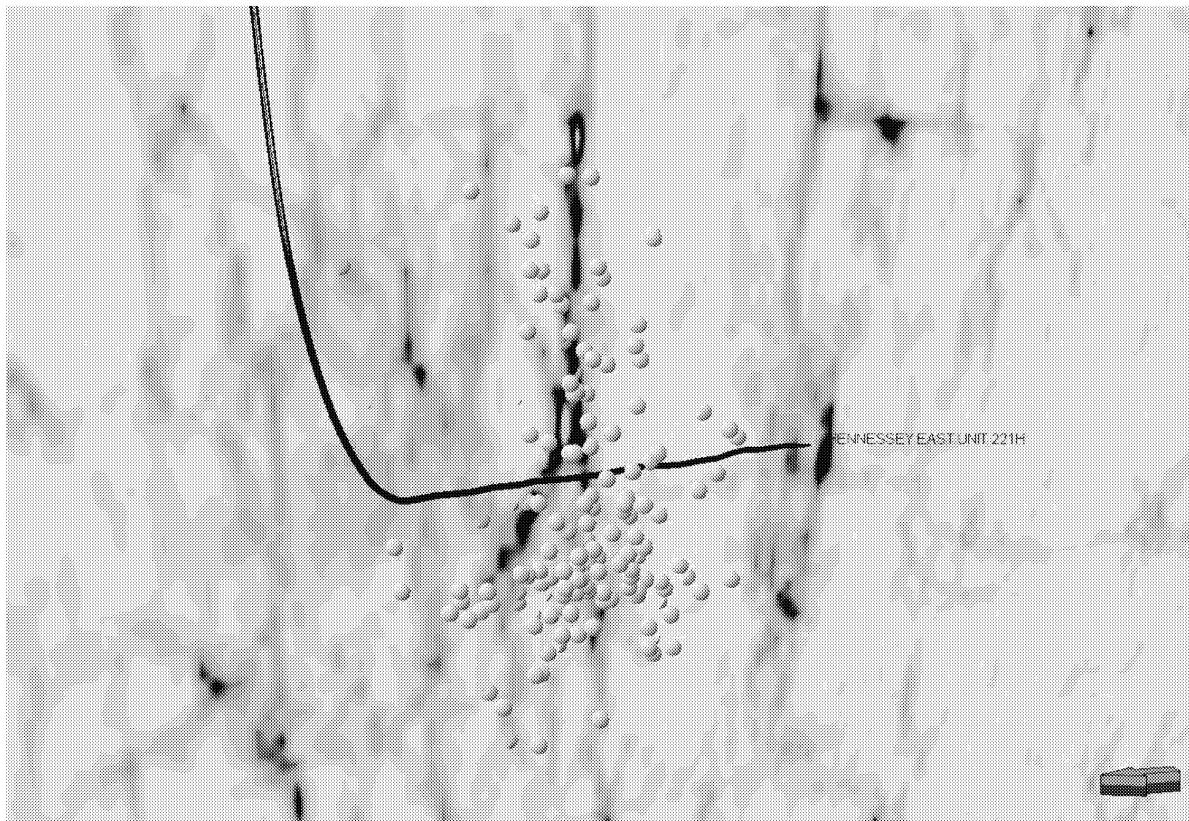
**Schlumberger**

## Ant-Tracking (IL 5620) calibration against Micro-seismic Well EHU-221H & Micro-seismic events (all stages)



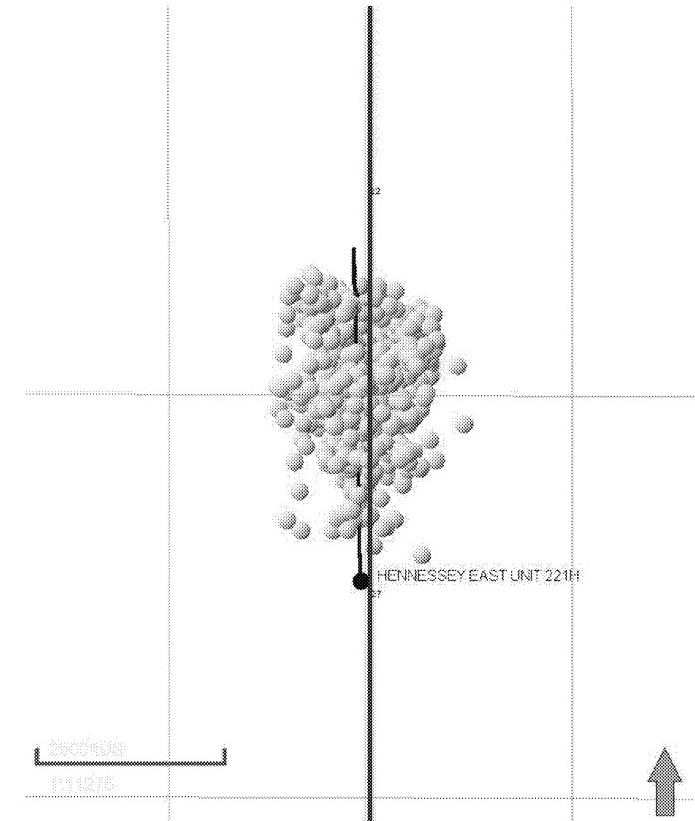
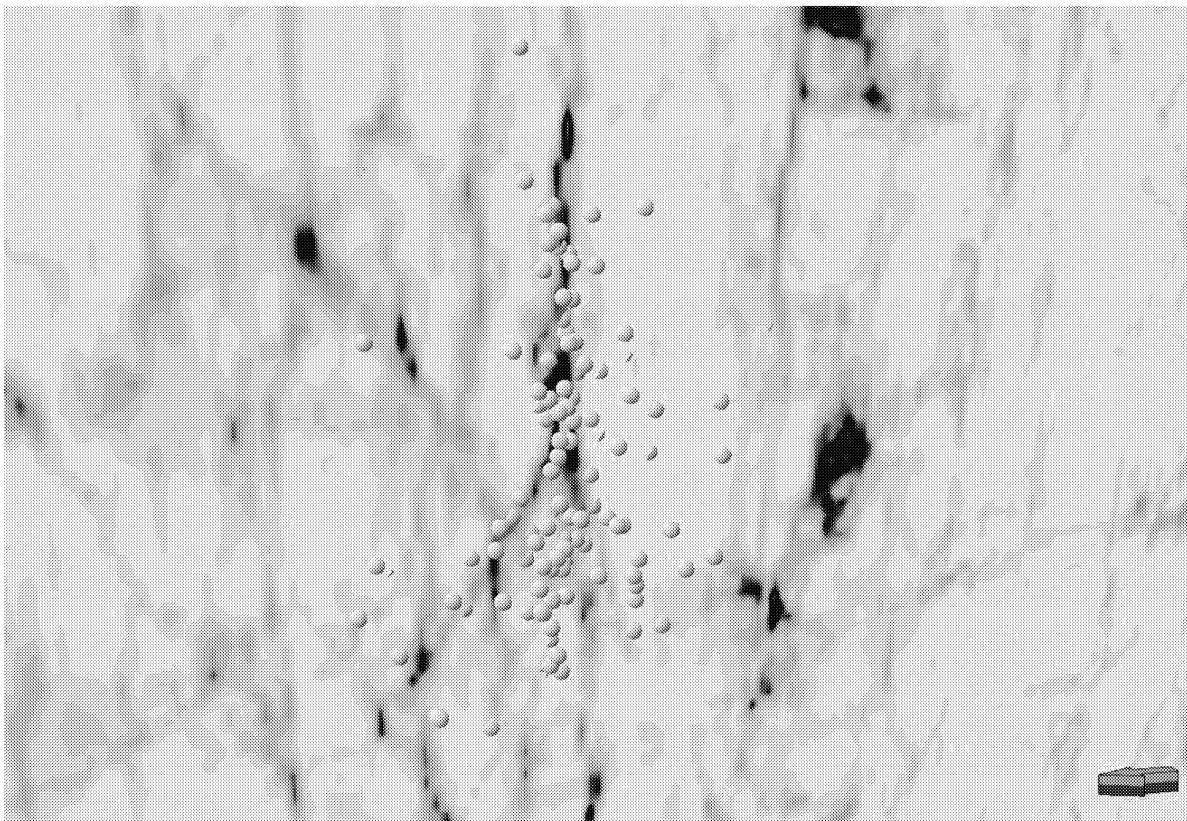
**Schlumberger**

## Ant-Tracking (IL 5620) calibration against Micro-seismic Well EHU-221H & Micro-sesimic events (all stages)



**Schlumberger**

## Ant-Tracking (IL 5622) calibration against Micro-seismic Well EHU-221H & Micro-sesimic events (all stages)

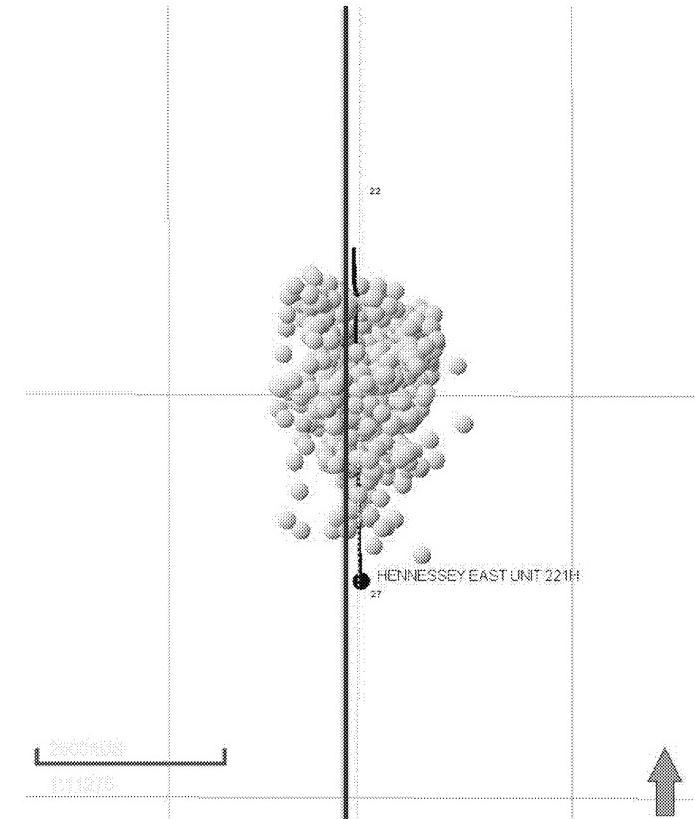
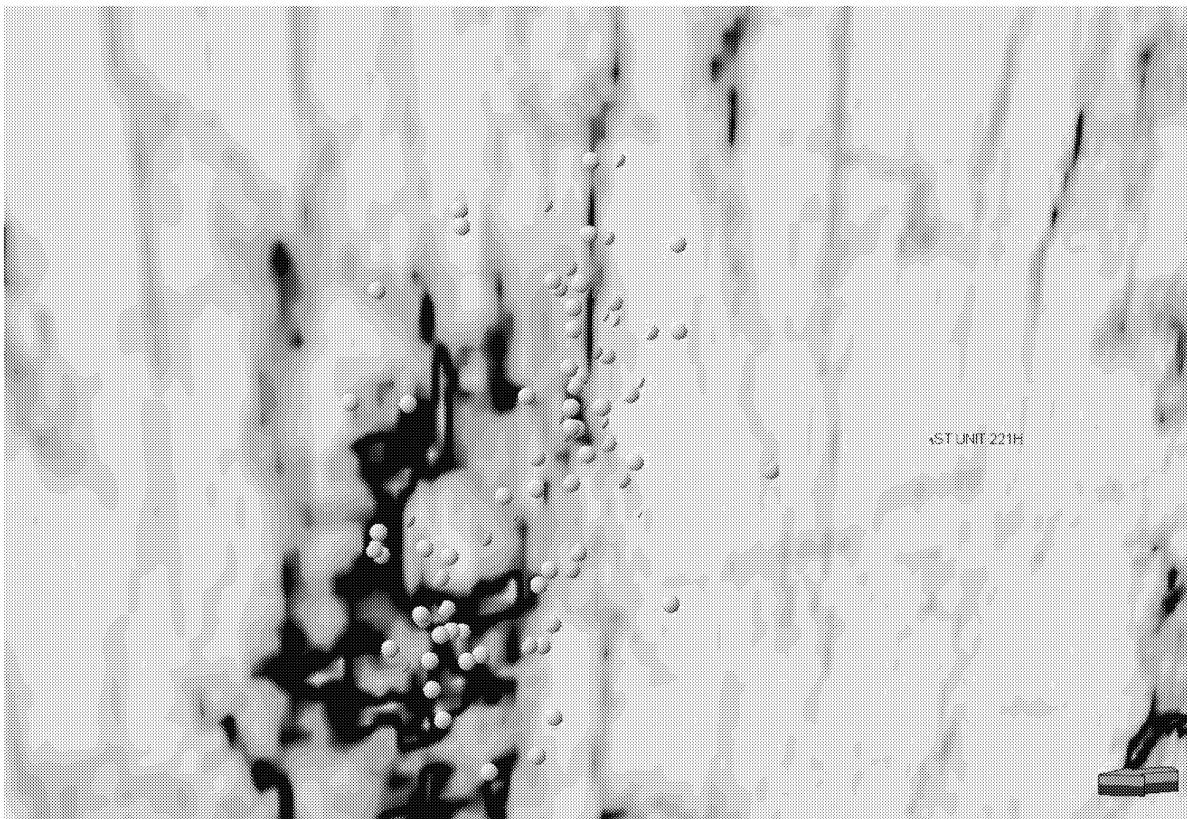


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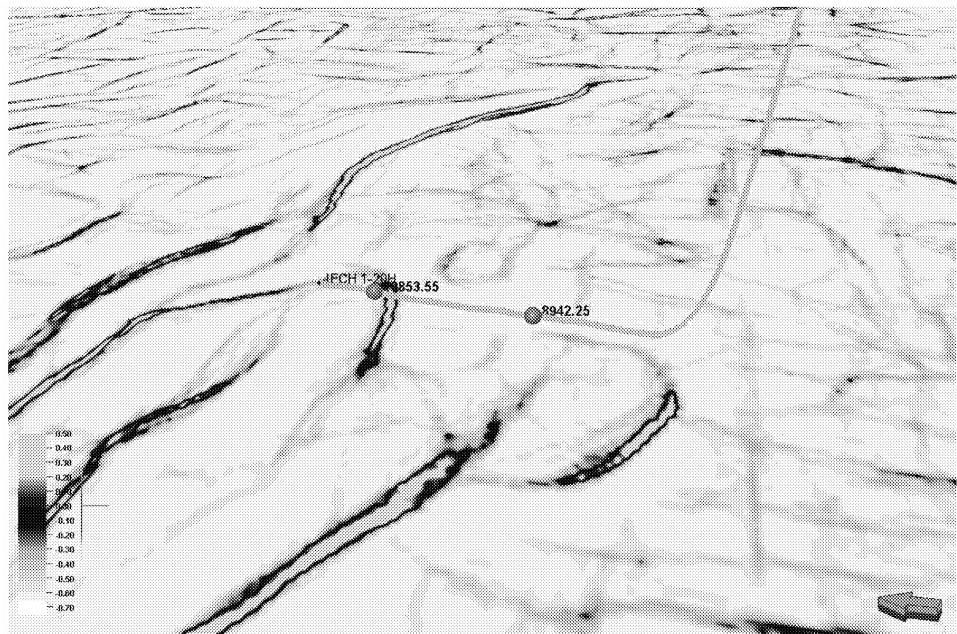
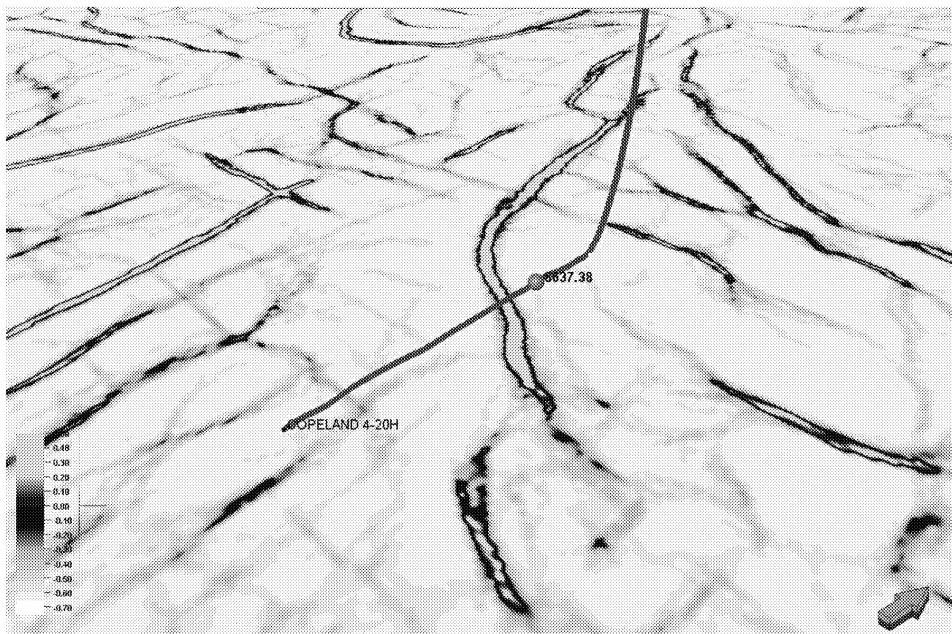
AMR\_SDTX01826890

## Ant-Tracking (IL 5616) calibration against Micro-seismic Well EHU-221H & Micro-seismic events (all stages)



**Schlumberger**

## Geosteering Interpreted Faults & Ant-Tracking Comparison Wells Copeland 4-20H & JFCH 1-20H (High level of correlation)



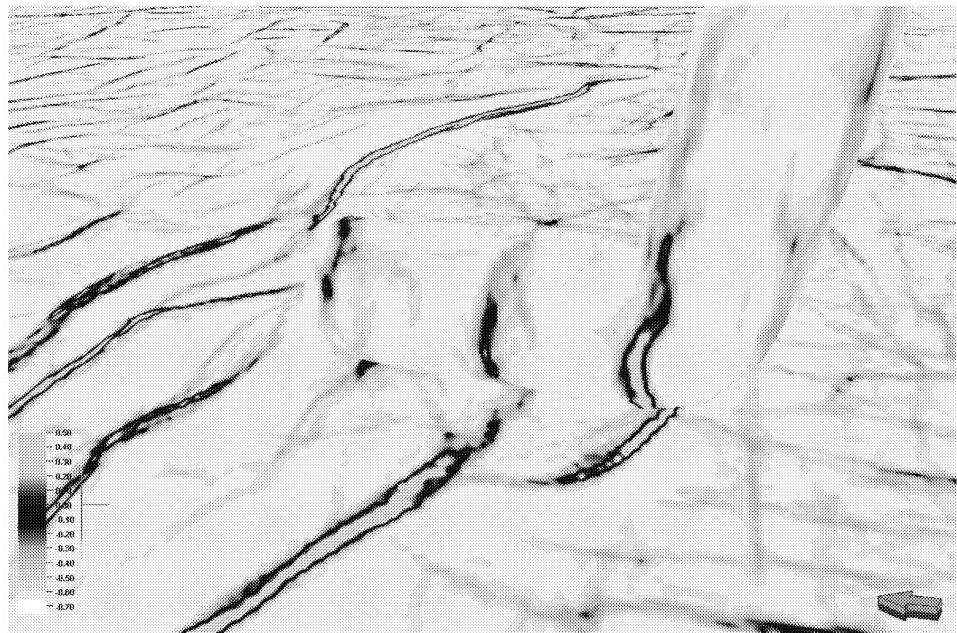
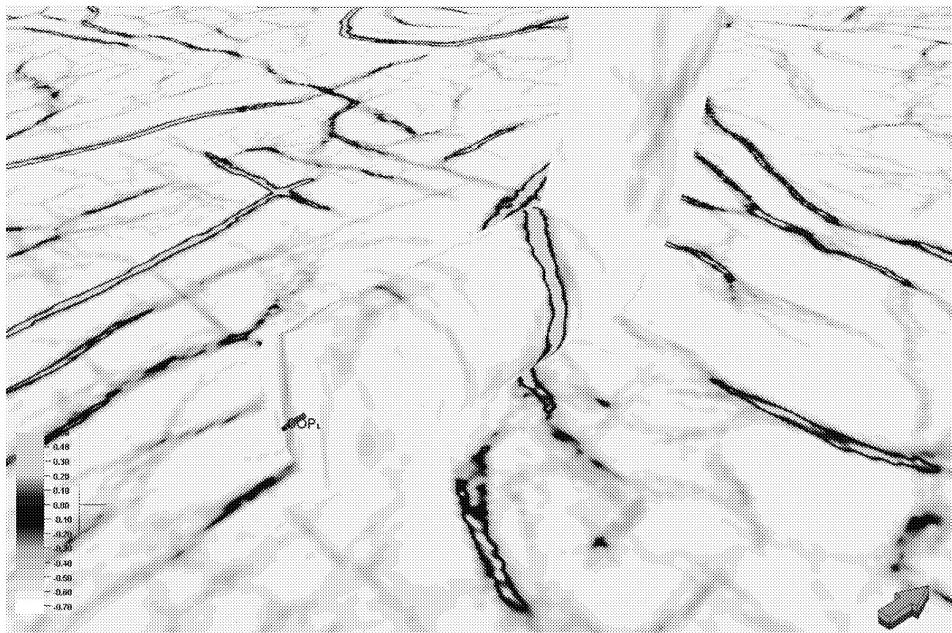
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## Geosteering Interpreted Faults & Ant-Tracking Comparison Wells Copeland 4-20H & JFCH 1-20H (High level of correlation)



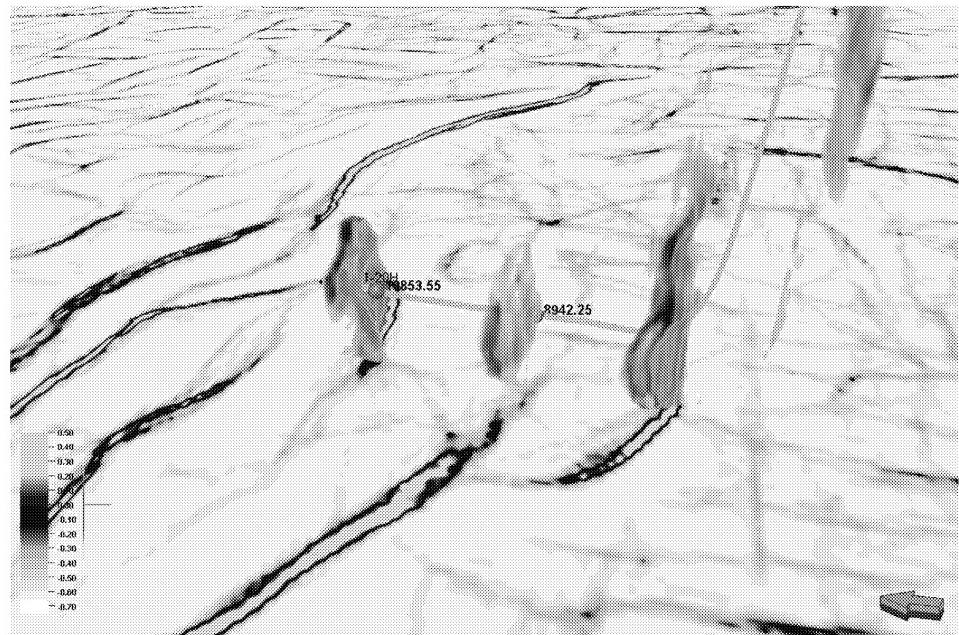
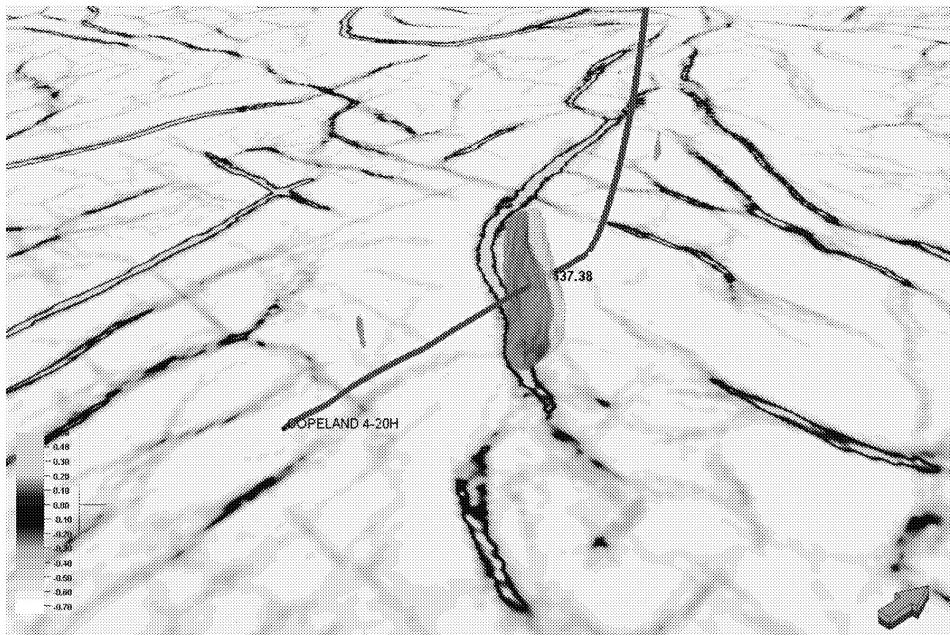
Schlumberger Confidential

**Schlumberger**

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## Geosteering Interpreted Faults & Ant-Tracking Comparison Wells Copeland 4-20H & JFCH 1-20H (High level of correlation)



Schlumberger Confidential

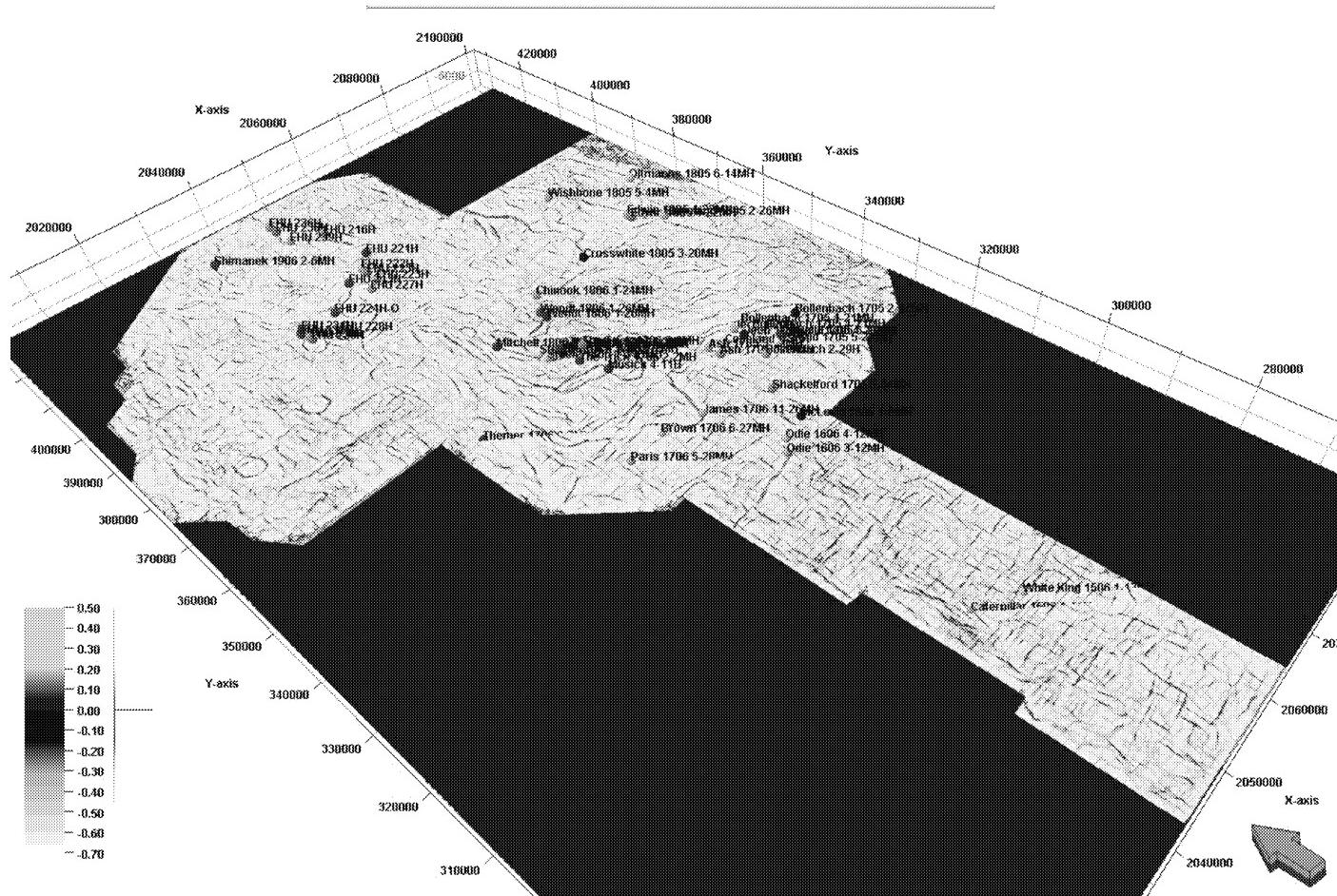
**Schlumberger**

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## Geosteering faults & Ant-Tracking

Geosteering faults loaded as points and assigned to the specified well trajectories.



Around 62 Geosteering interpreted faults were loaded as points and assigned to the specified well trajectories.

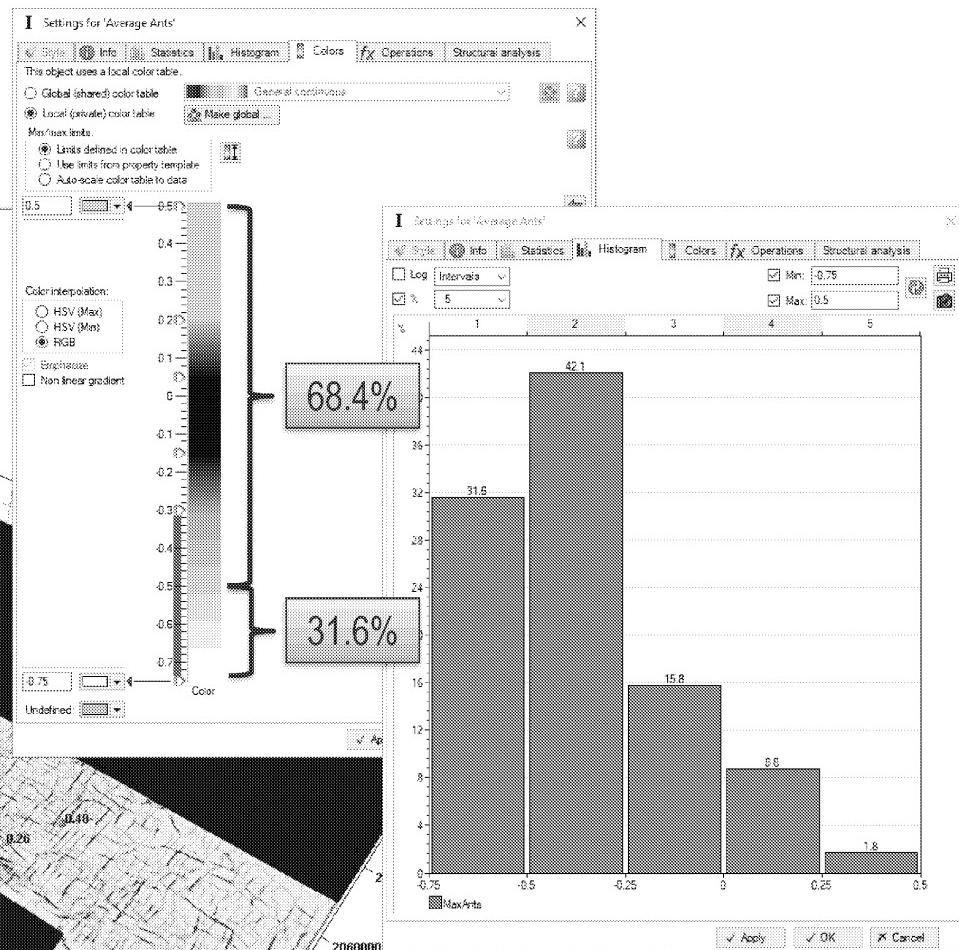
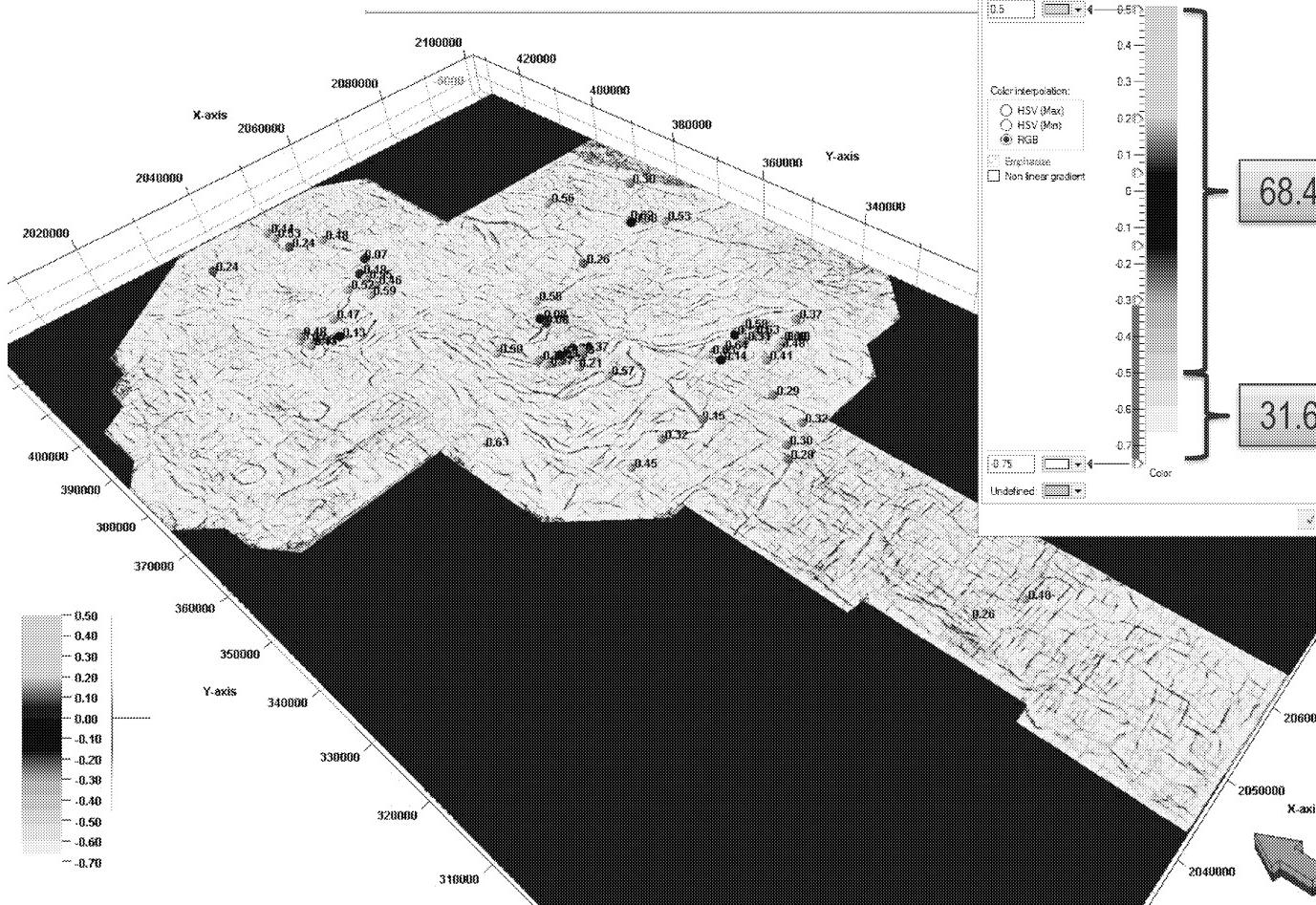
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# Geosteering faults & Ant-Tracking

## Ant-Tracking anomalies extracted at the points

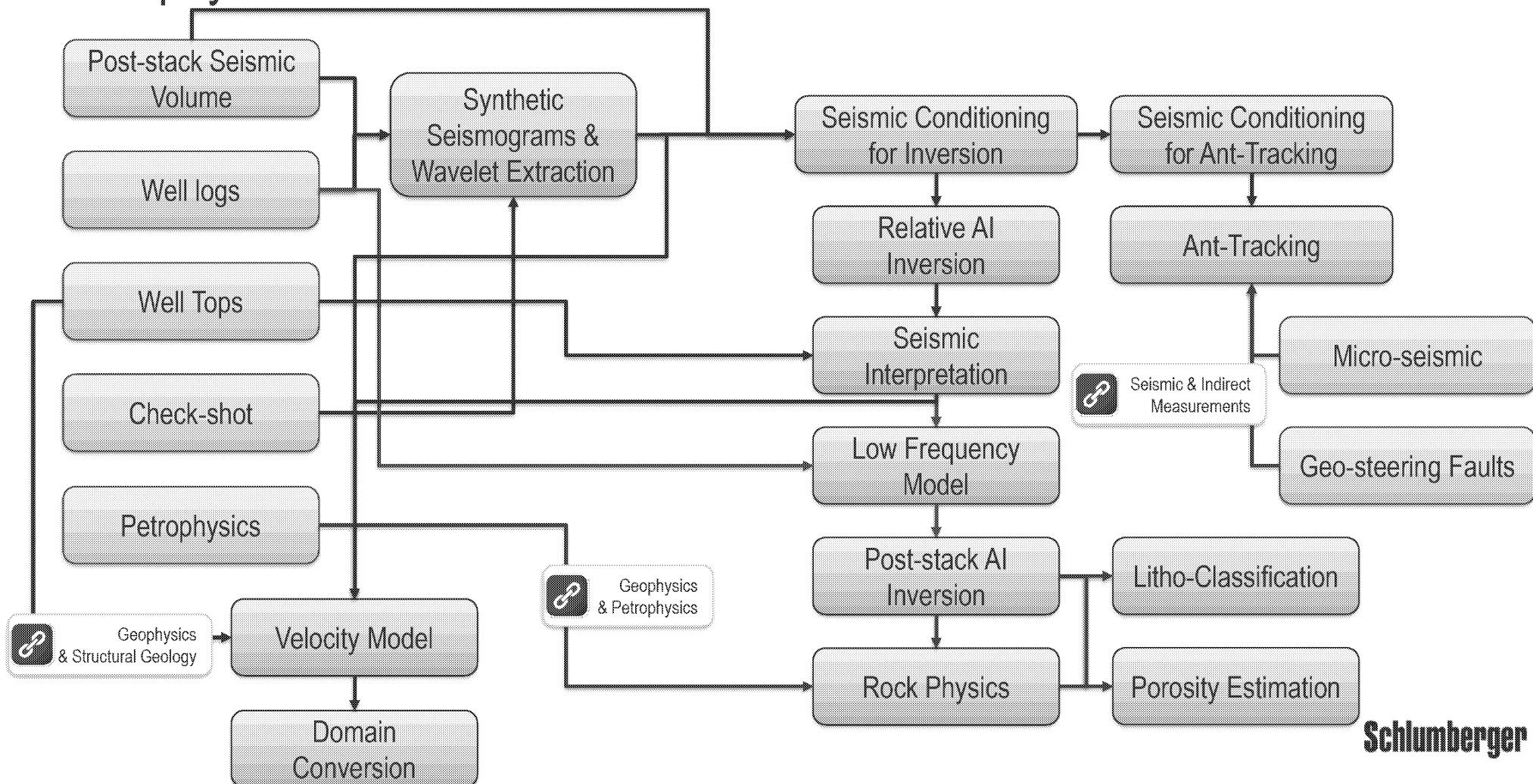


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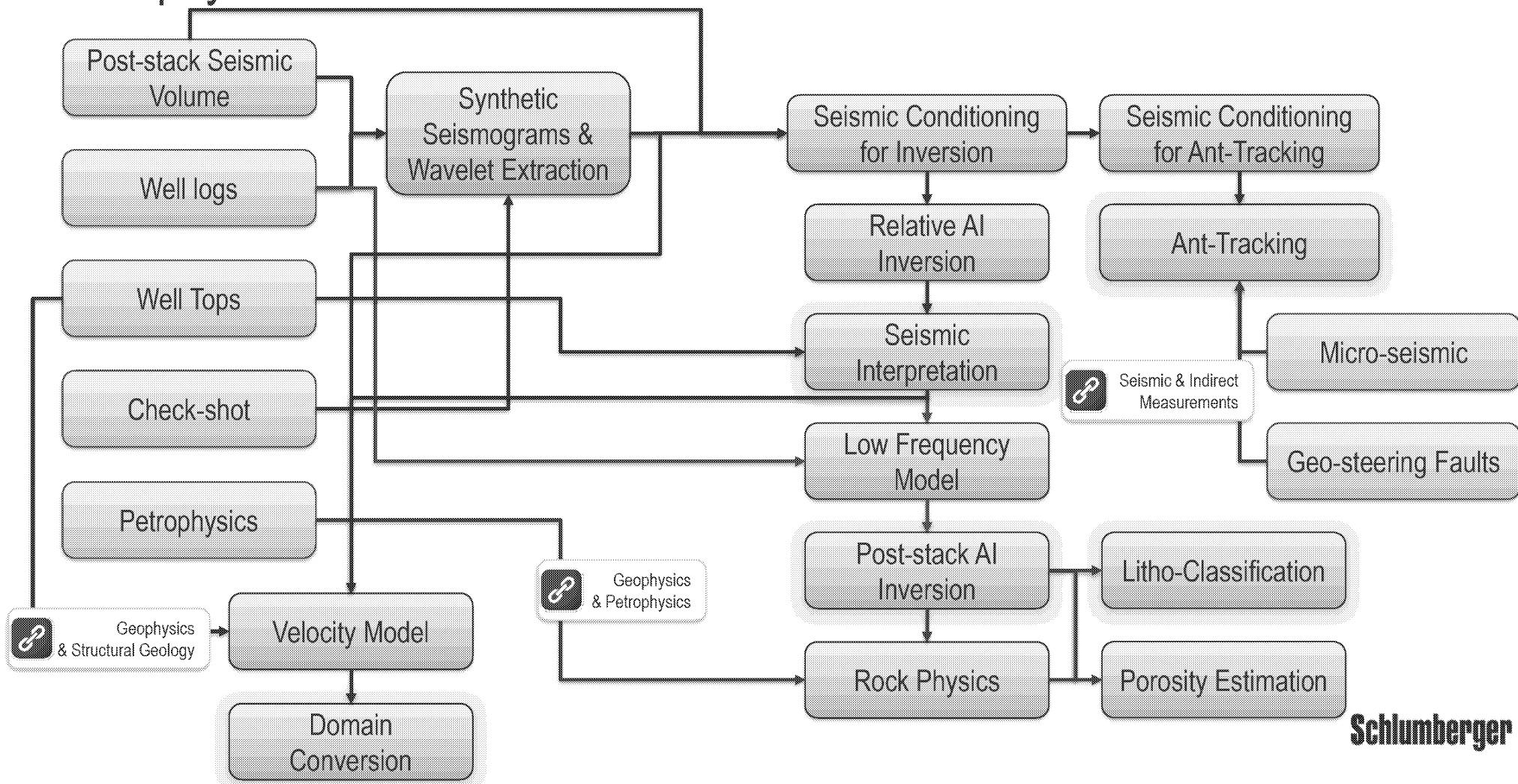
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# Geophysics Workflow Overview



# Geophysics Workflow Overview



# Additional Questions?

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# Geologic Modeling – Full Field

Workshop – May 24, 2018

Doss Barker

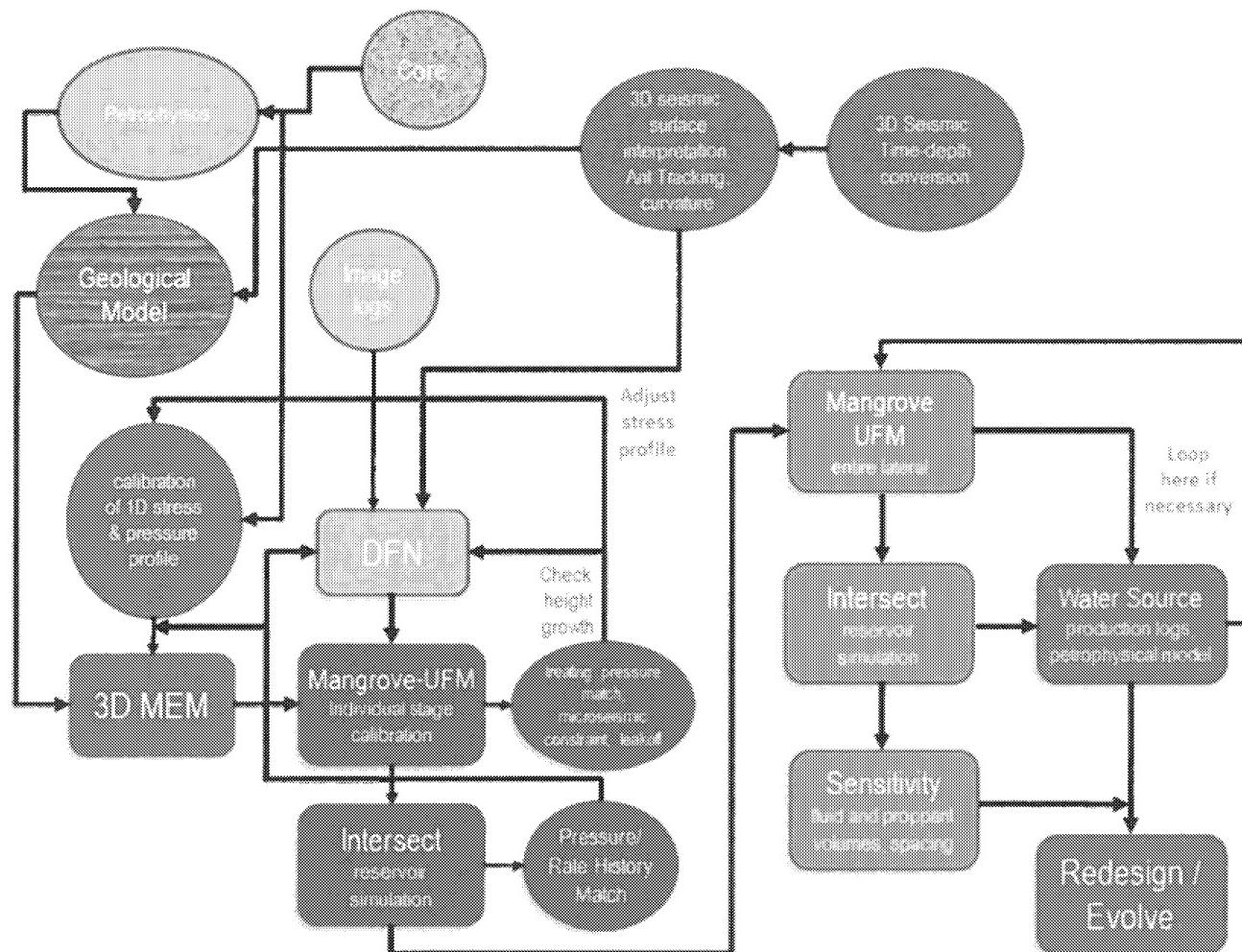
Senior Geoscientist - SIS



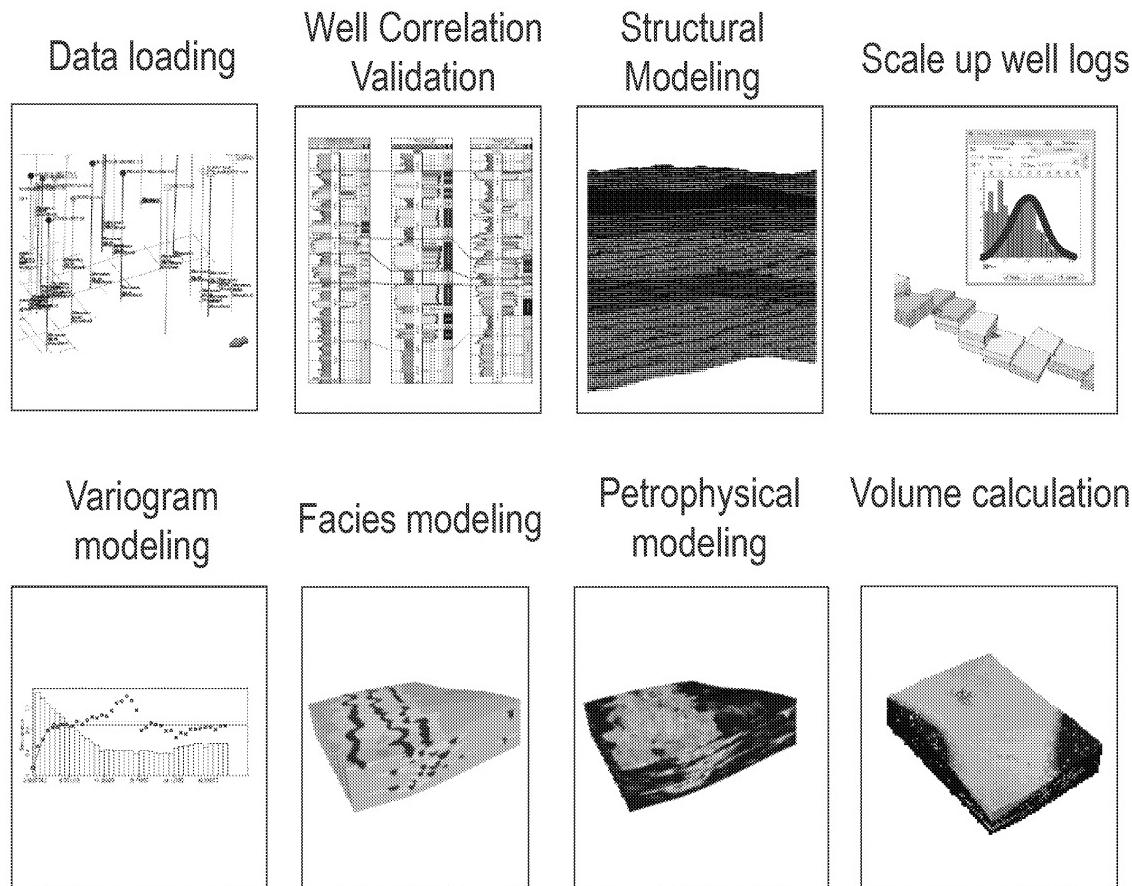
ALTA MESA  
HOLDINGS, LP

Schlumberger

## Phase 2 Workflow – Geological Static Modeling

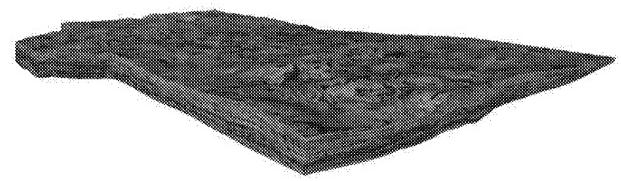


# Petrel Property Modeling Workflow



Inputs for the model:

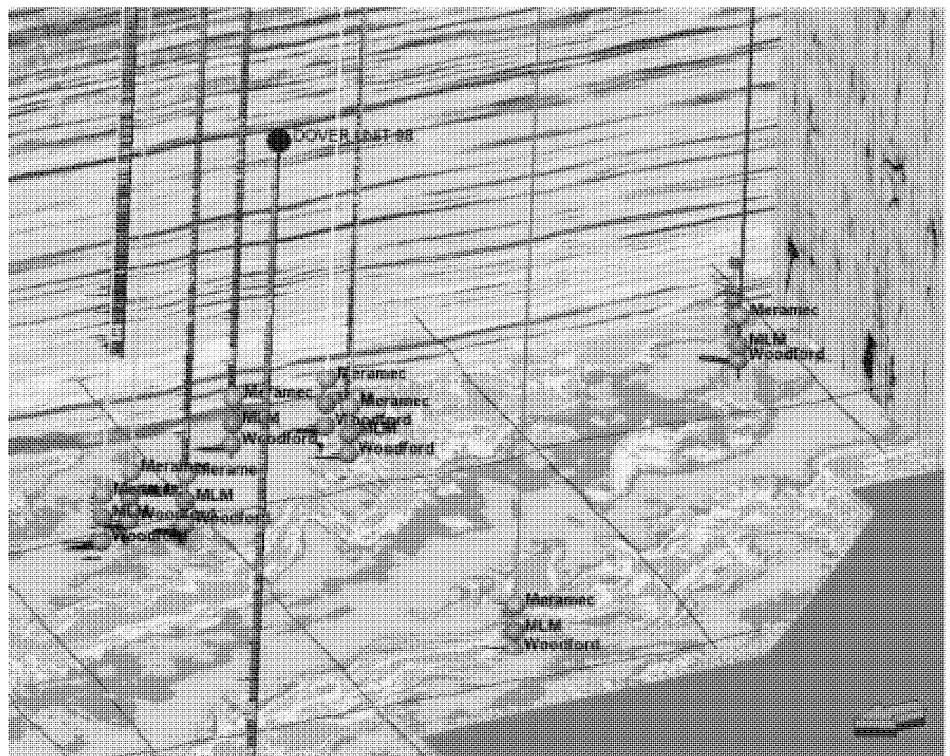
- Culture data
- Log data
- Well tops
- Seismic horizons
- Seismic attributes



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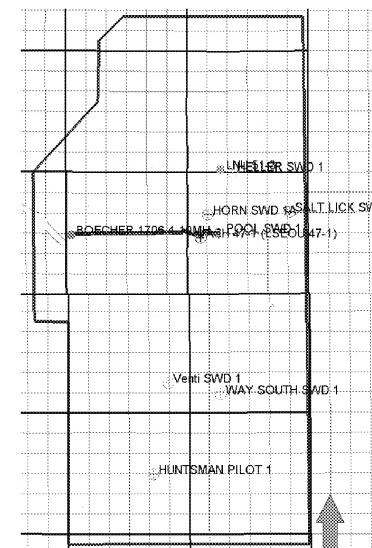
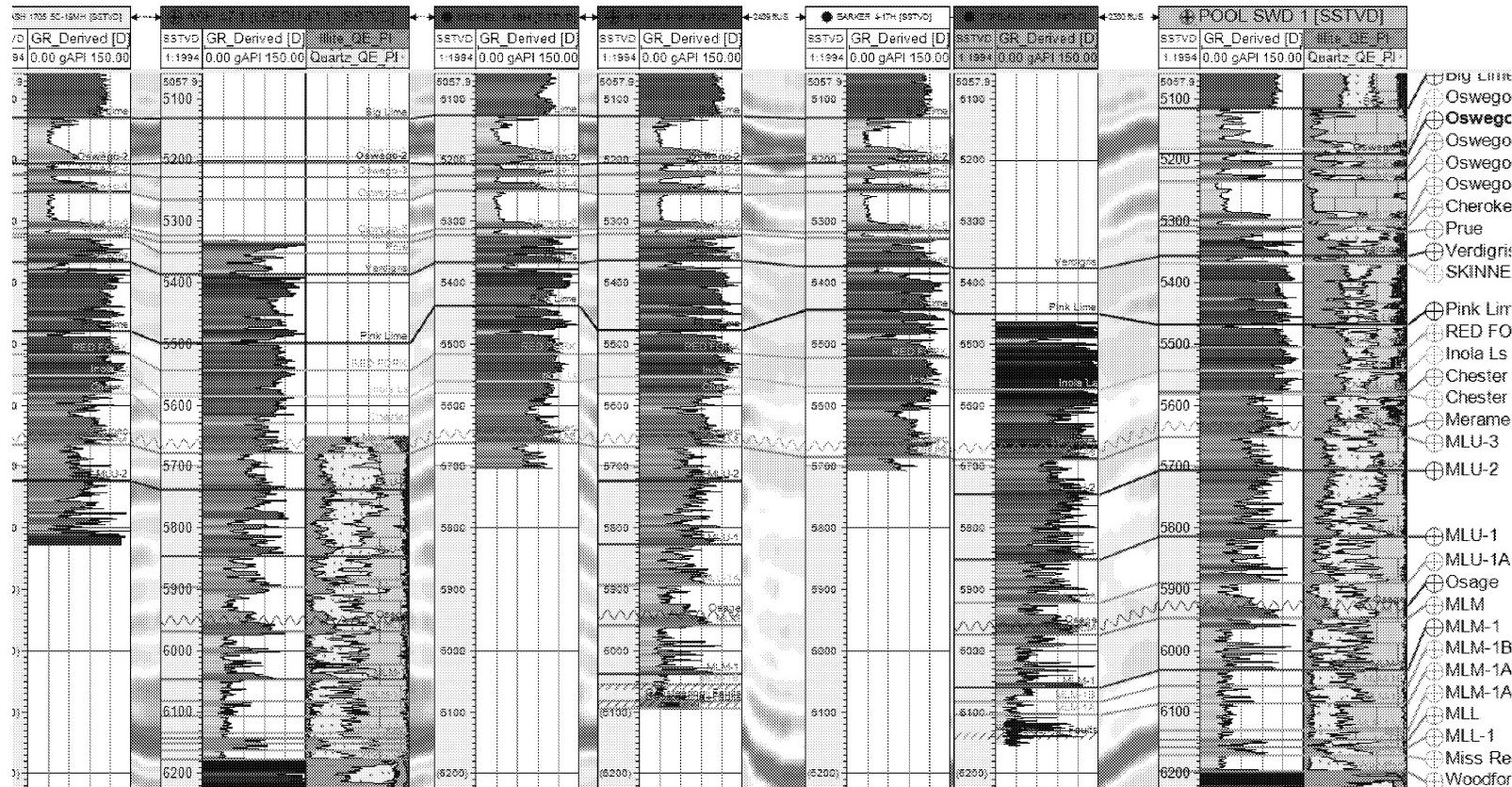
## Data Import

- Set up Petrel project (CRS, units, templates)
- Import culture data (townships, sections, boundary polygons)
- Import well data (well heads, deviation surveys, logs, observed data, well tops)
- Import seismic data (3D attribute volumes and interpreted horizons)



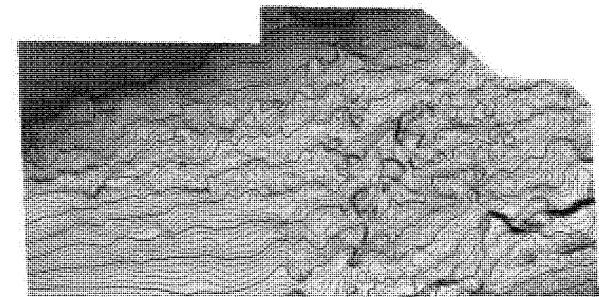
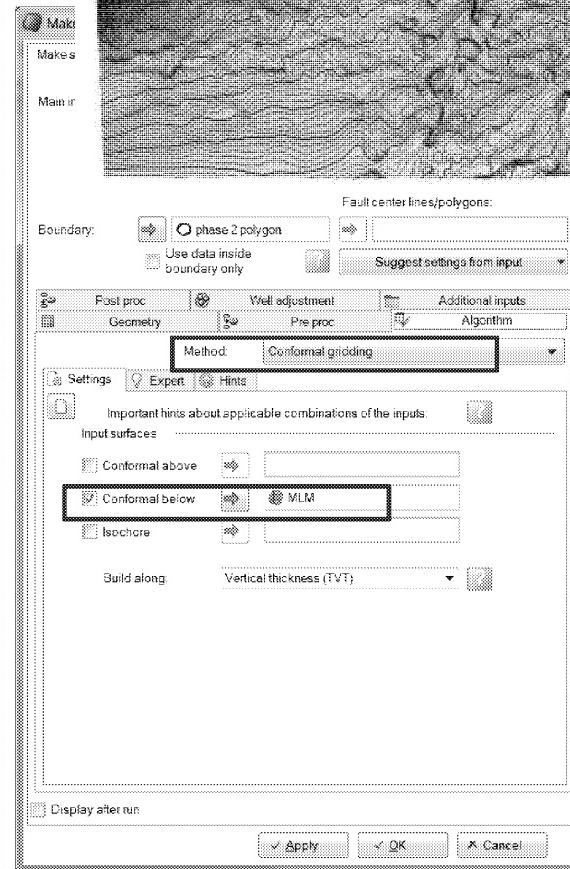
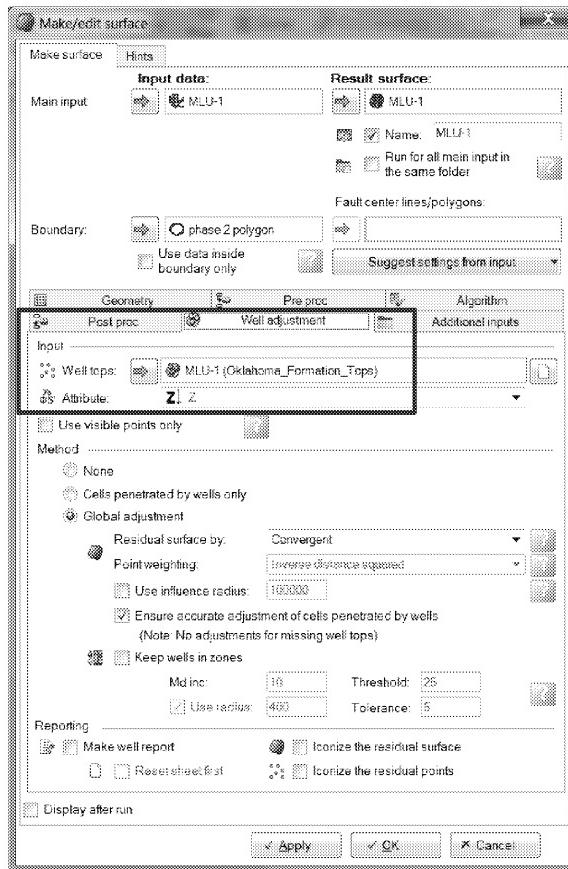
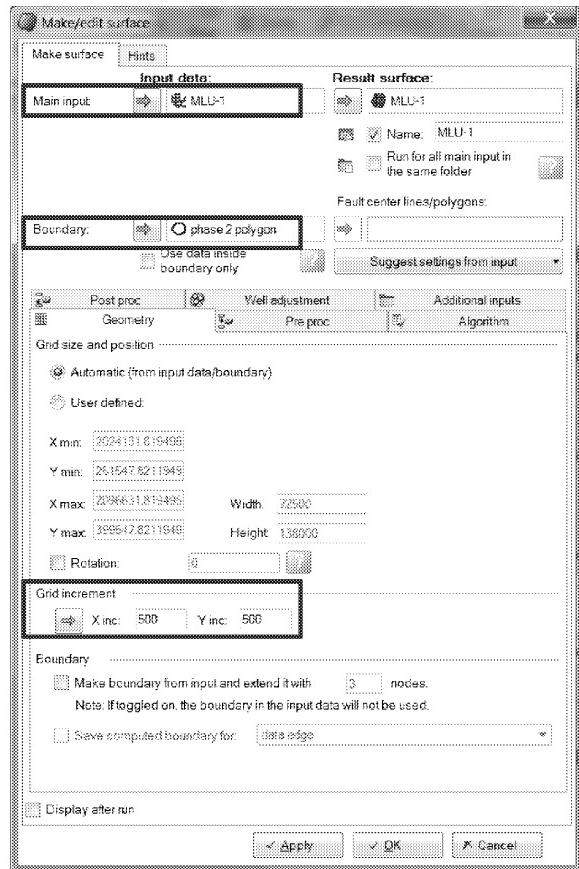
**Schlumberger**

# Well Correlation Validation



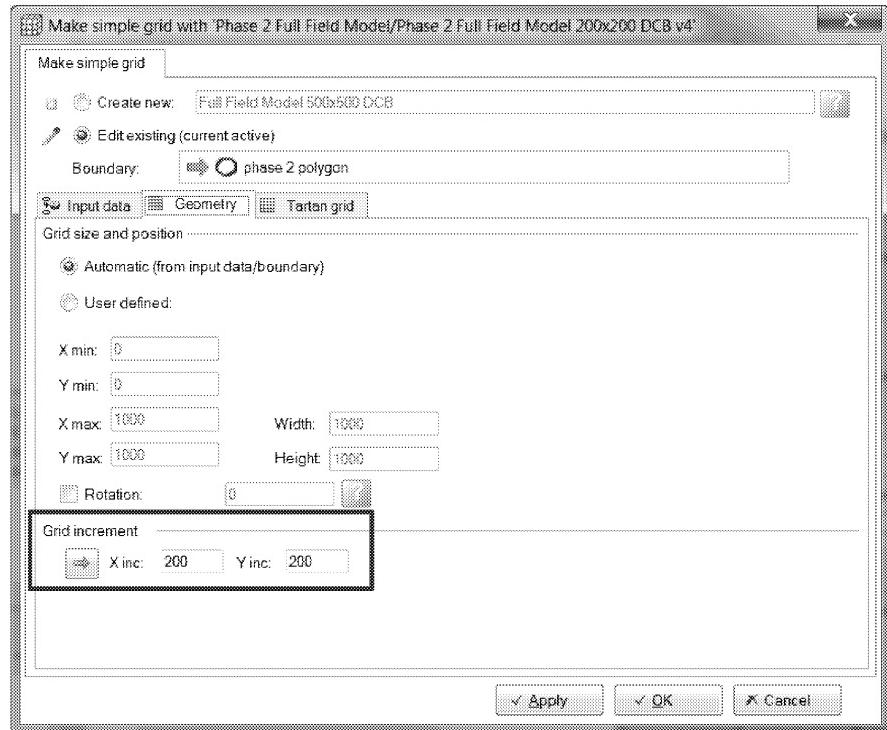
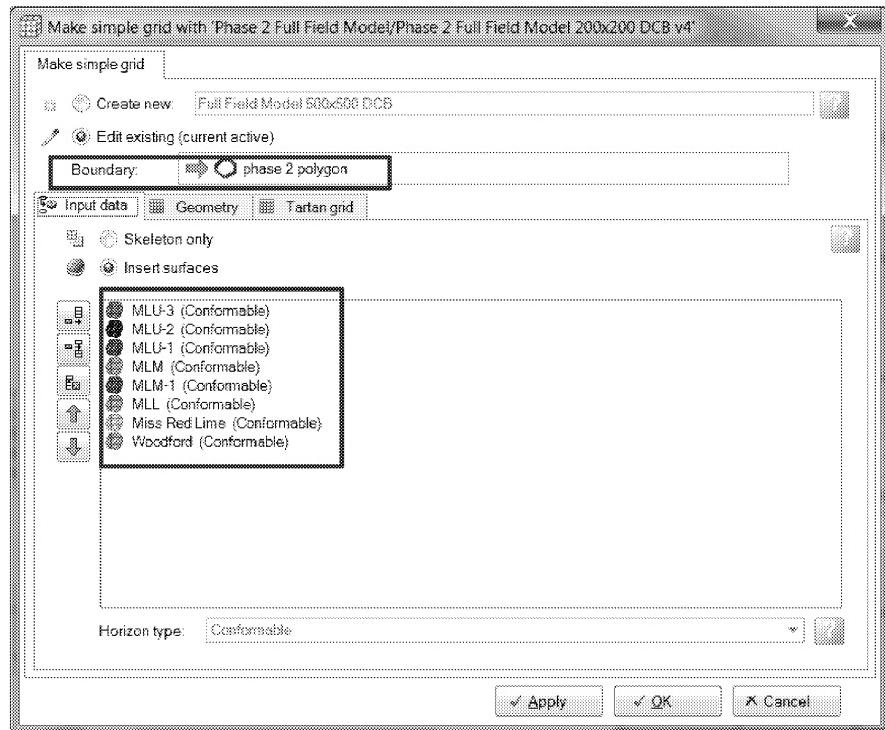
**Schlumberger**

# Generate Structural Surfaces



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# Structural Modeling using Make Simple Grid Process

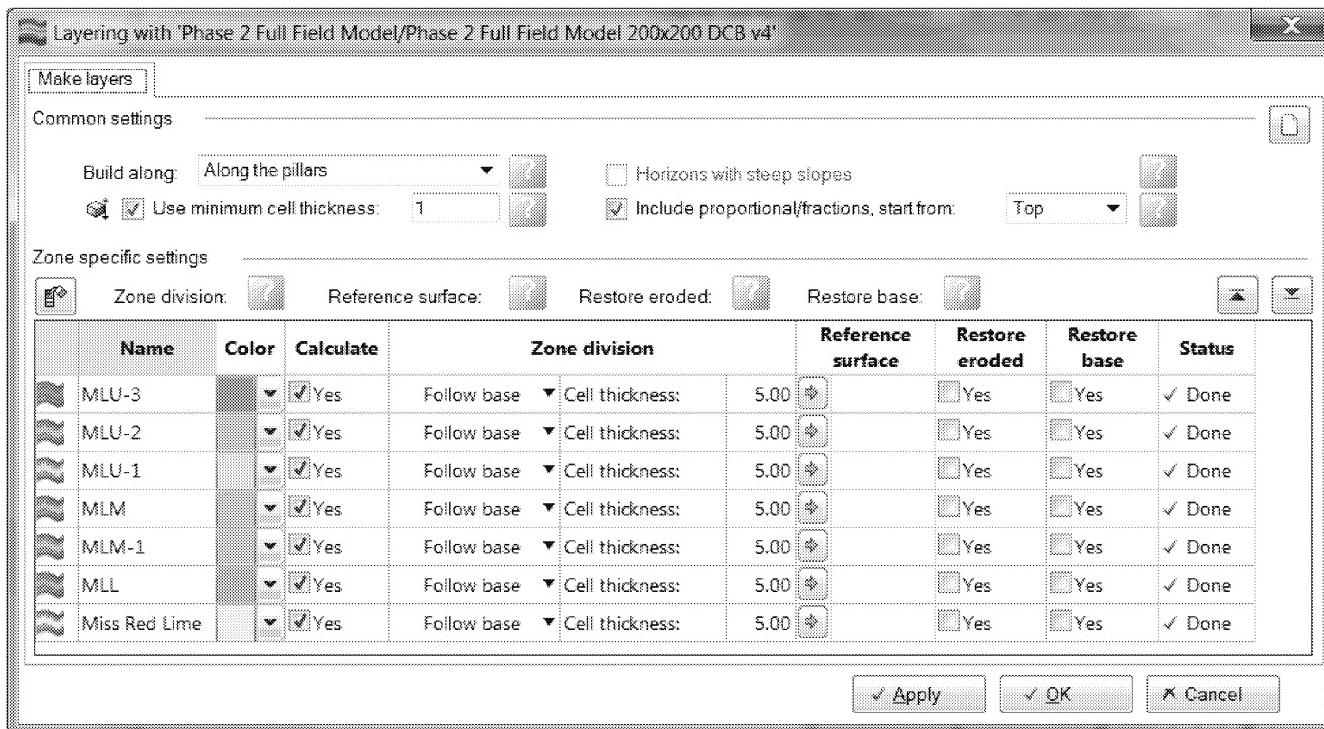


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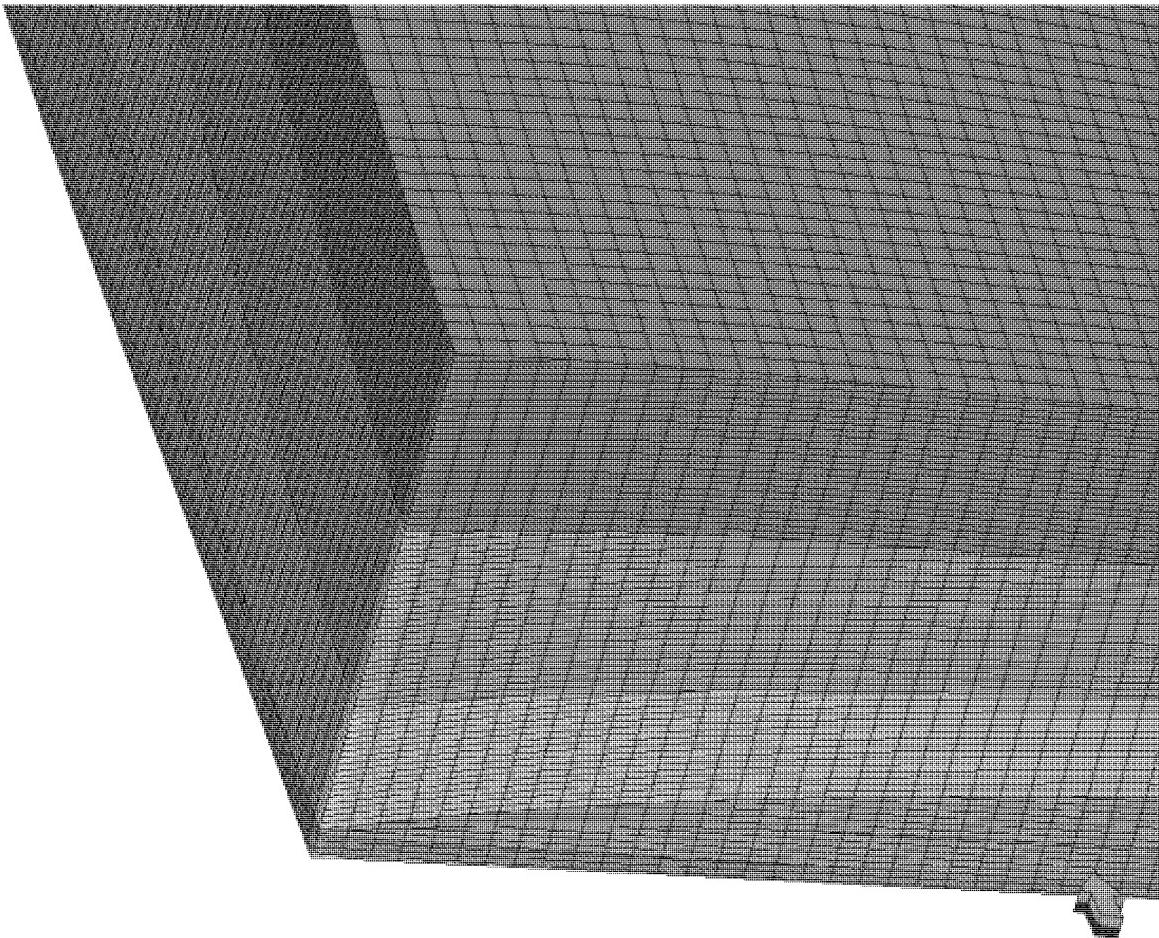
AMR\_SDTX01826906

# Add Vertical Resolution with Layering Process



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## Structural Model Ready to be Populated



55 Million Cells  
200 x 200 x 5 ft  
Area = 314 sq mi

- Horizons
- MLU-3
- MLU-2
- MLU-1
- MLM
- MLM-1
- MLL
- Miss Red Lime
- Woodford

**Schlumberger**

# Upscale Log Properties into Structural Model

**Scale up well logs with: Phase 2 Full Field Model/Phase 2 Full Field Model 200x200 DCB v4**

**Make property**

- Create new
- Edit existing:
- Use local grid filter
- Replace and add new
- Leave all other cells unchanged

**Show result in well section**

HRA\_5 - seismic prob trends v4 [U]

**Input**

- Well logs
- Welltop attributes
- Points attribute

**Select log**  HRA\_5

**Settings**

Average method: Most of

Up scaled property:  HRA\_SRJ

Up scaled from:  HRA\_5

Use bias

Use weighting

Samples selection

Treat log: As lines

Method: Neighbor cell

Min. number of points in cell:

Zone correction

Outputs

Well report

Reset output sheet

Zone corrected log

3D grid zone log

3D grid well tops

**Scale up well logs with: Phase 2 Full Field Model/Phase 2 Full Field Model 200x200 DCB v4**

**Make property**

- Create new
- Edit existing:
- Use local grid filter
- Replace and add new
- Leave all other cells unchanged

**Show result in well section**

PHT\_GE\_P - HRA 5 seismic prob trends v4 [U]

**Input**

- Well logs
- Welltop attributes
- Points attribute

**Select log**  PHT\_GE\_P

**Settings**

Average method: Arithmetic

Up scaled property:  HRA\_5 - seismic prob trends v4 [U]

Up scaled from:  HRA\_5

Use bias

Use weighting

Samples selection

Treat log: As lines

Method: Neighbor cell

Min. number of points in cell:

Zone correction

Outputs

Well report

Reset output sheet

Zone corrected log

3D grid zone log

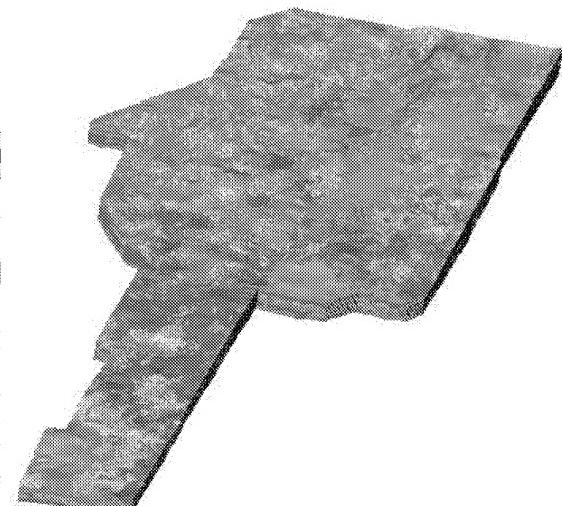
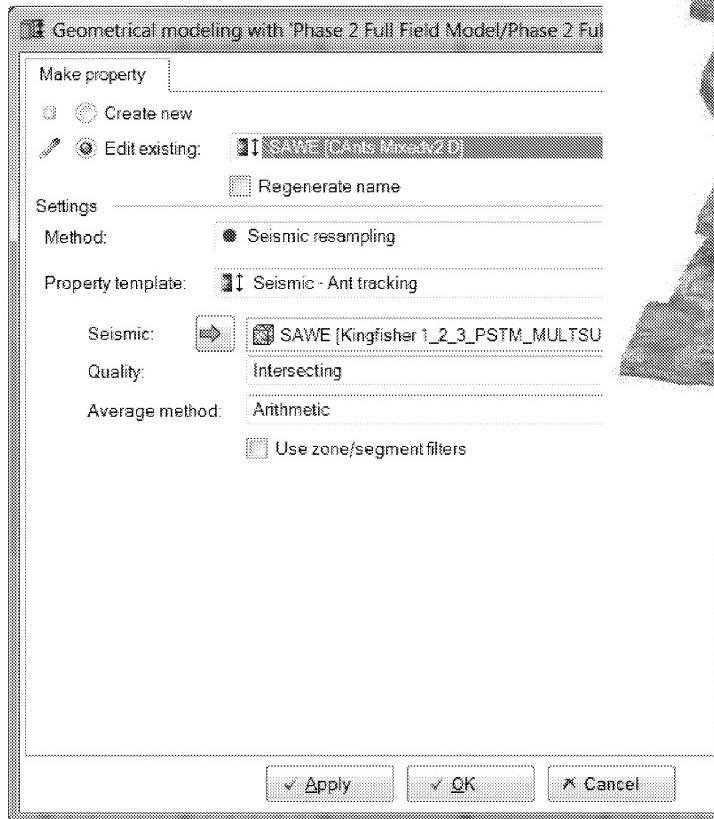
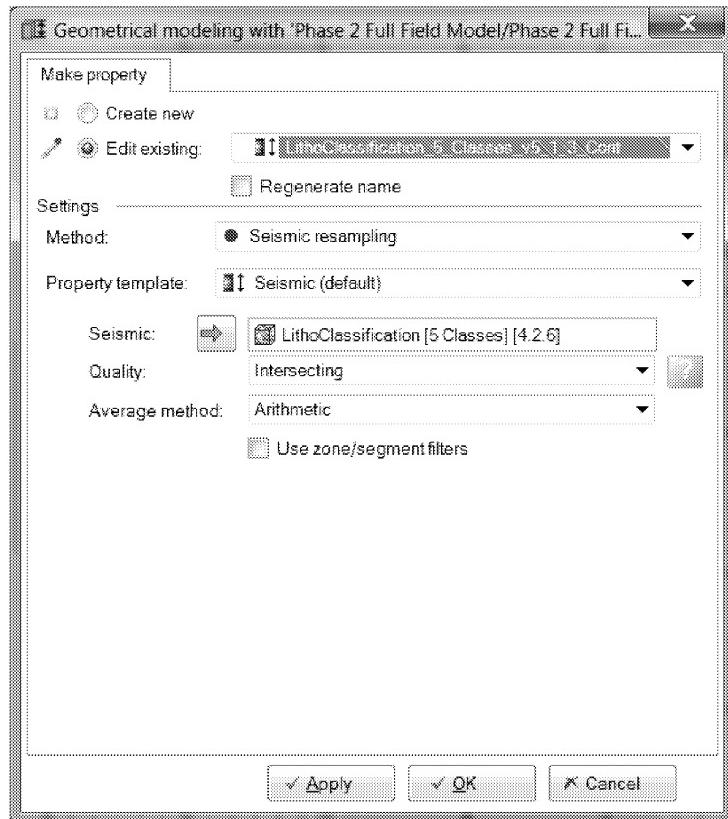
3D grid well tops

37 wells with  
HRA and other  
logs of interest



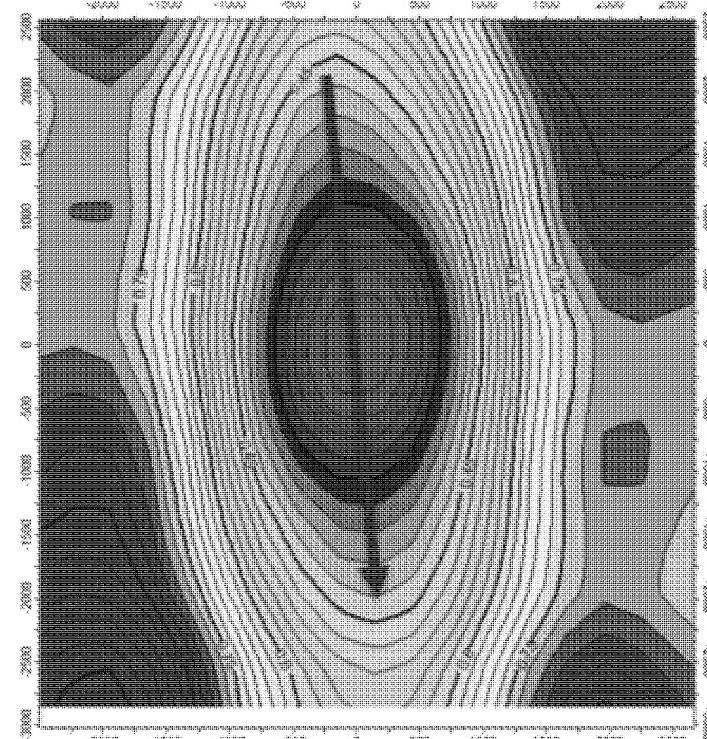
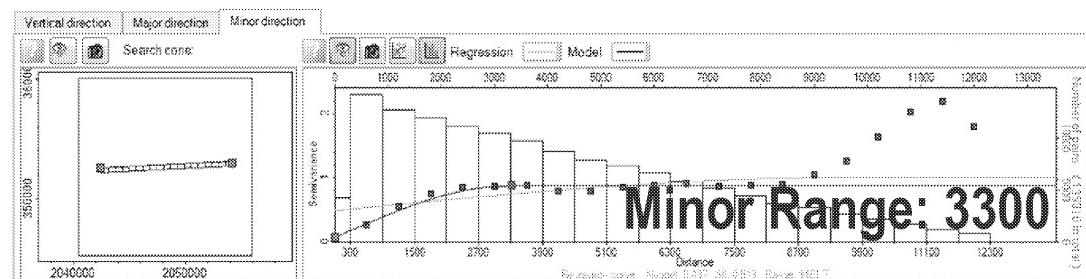
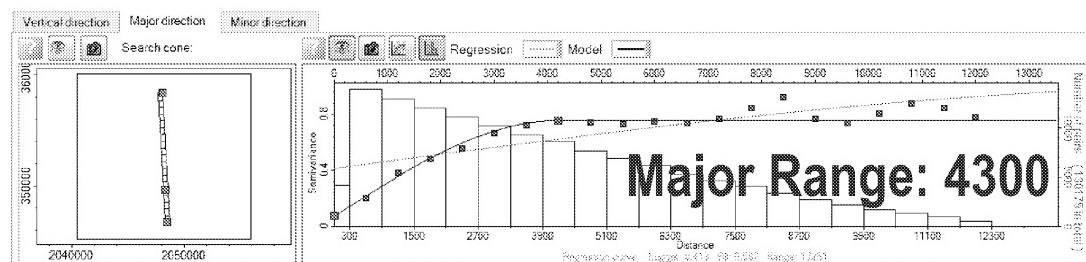
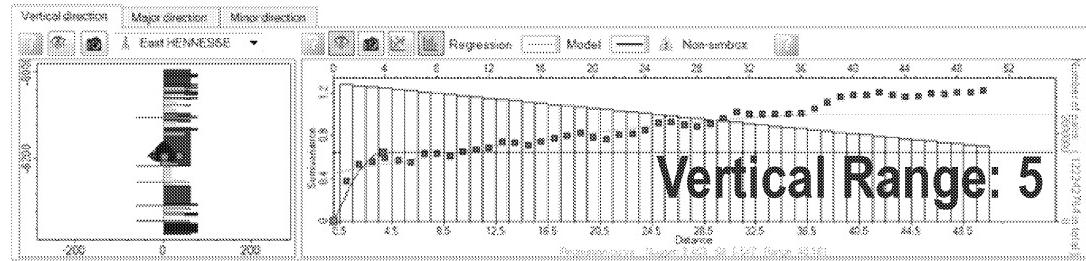
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## Sample Seismic Data into Structural Model



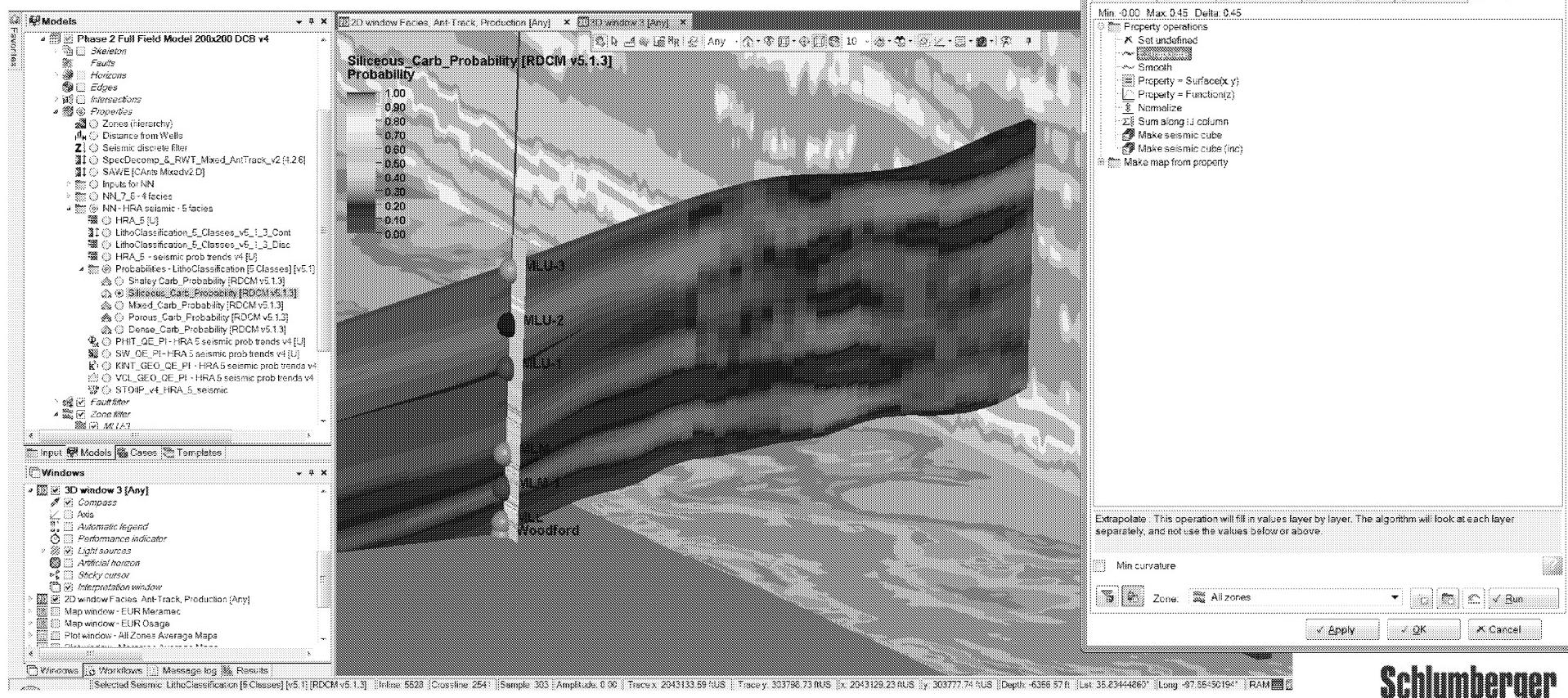
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## Variogram Analysis – MLM-1 Zone Example



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# Extrapolated Siliceous Carbonate Facies Probability for Populating Model Area Outside Seismic Survey

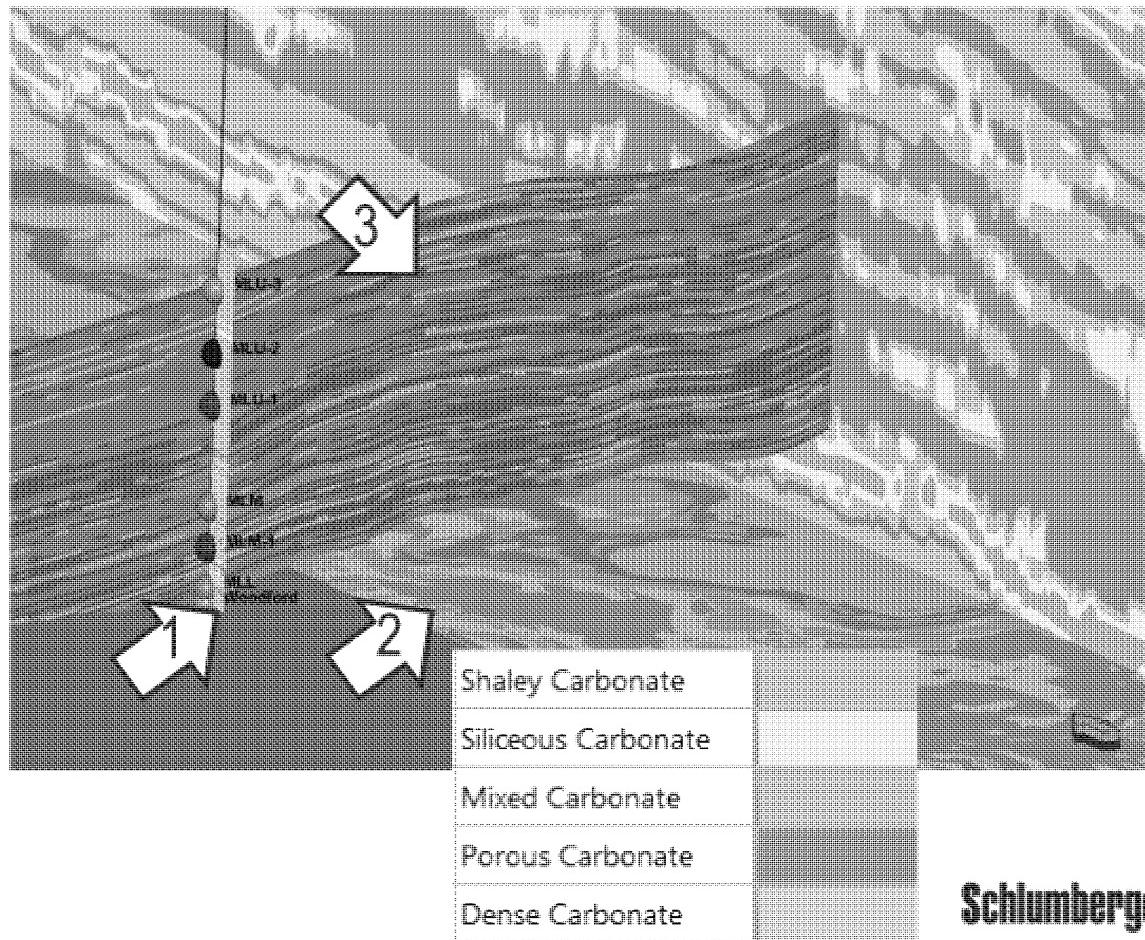
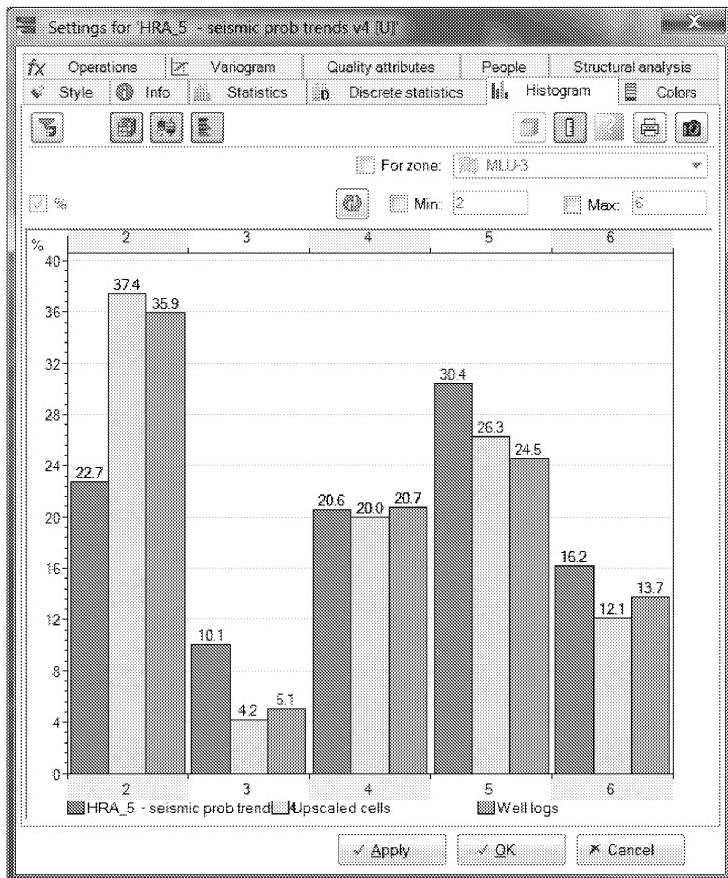


**Schlumberger**

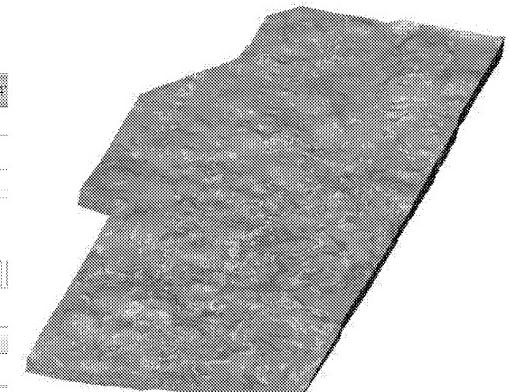
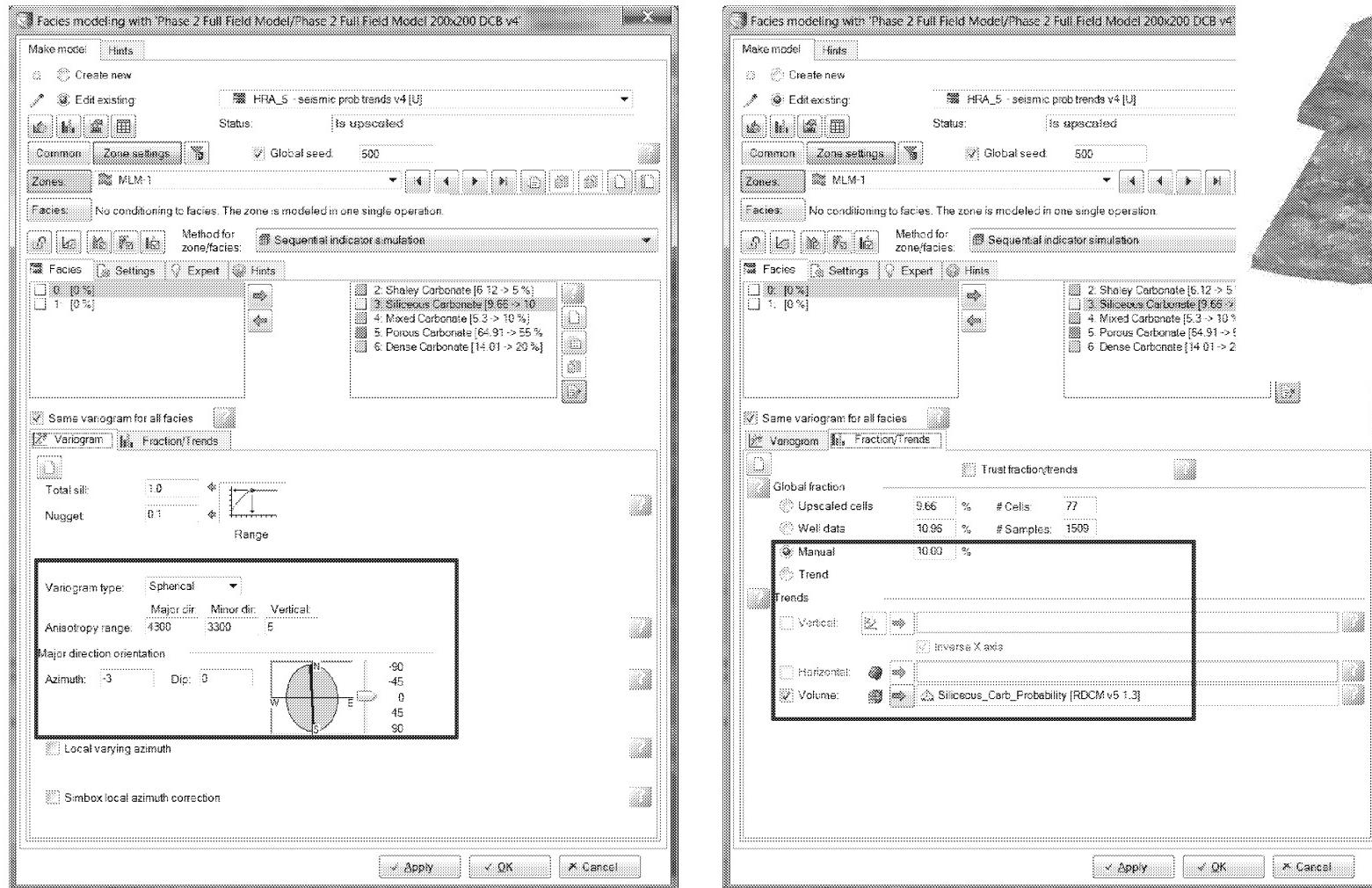
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# Facies Property Combining HRA log and Seismic Lithoclassification



# Facies Modeling Process



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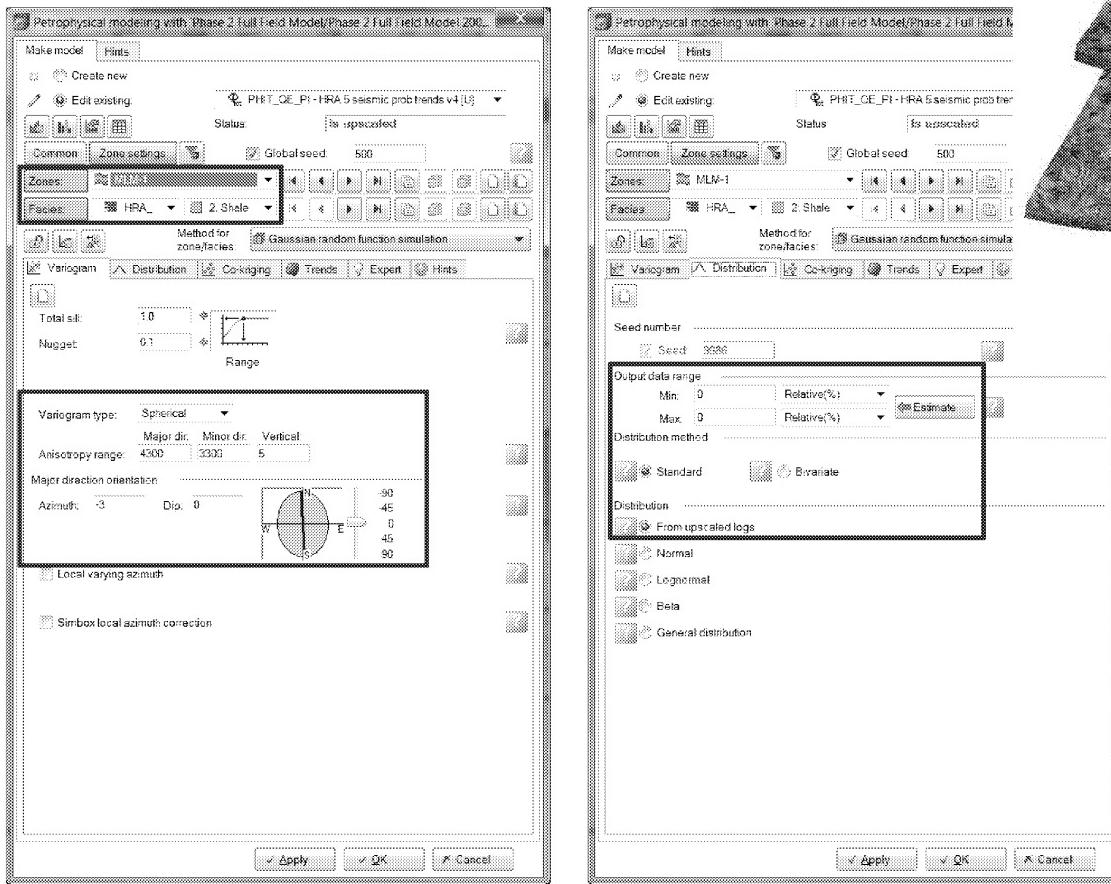
**Schlumberger**

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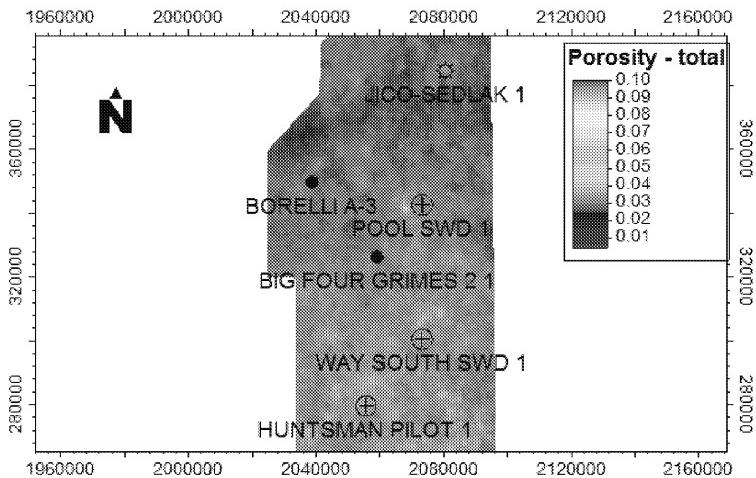
AMR\_SDTX01826914

# Petrophysical Modeling

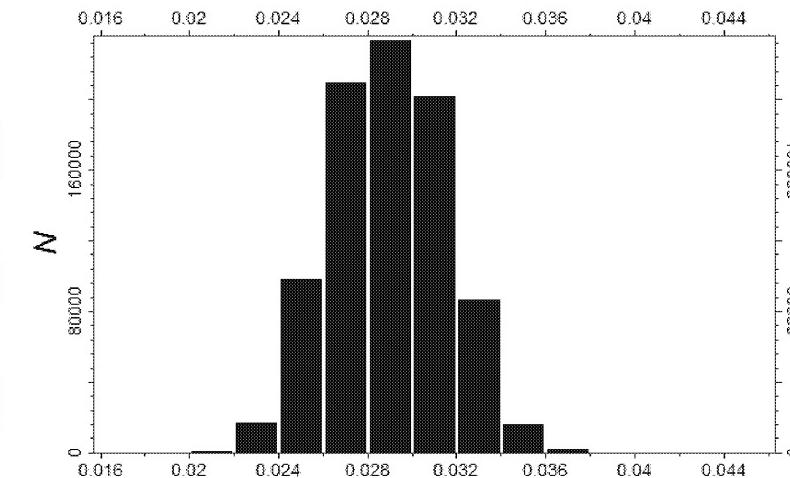
- Porosity
- Water Saturation
- Permeability
- Volume Clay



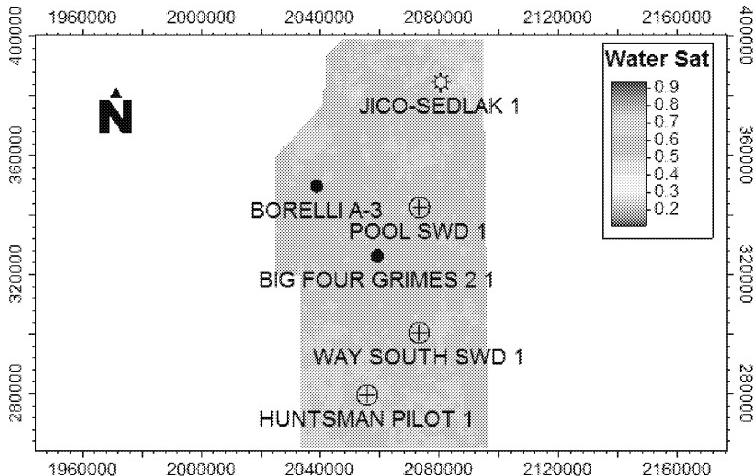
Average PHIT Map for All Zones



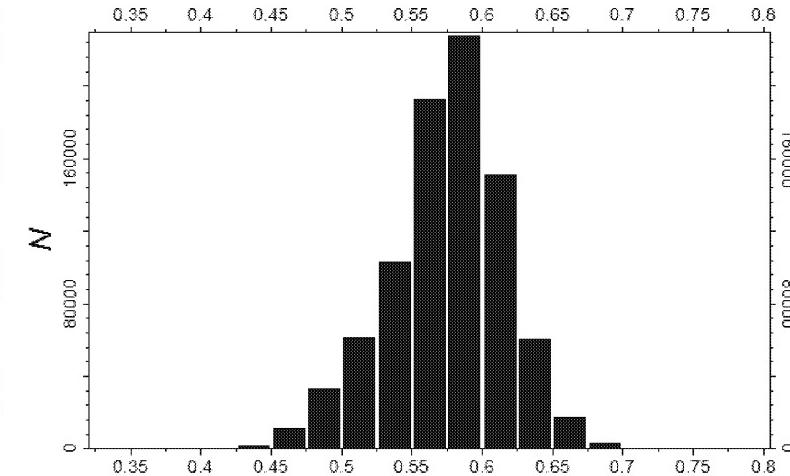
Average PHIT Map for All Zones



Average SW Map for All Zones



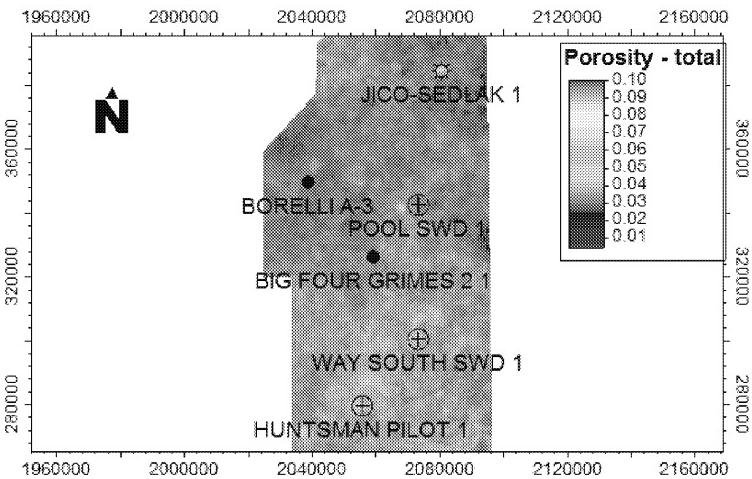
Average SW Map for All Zones



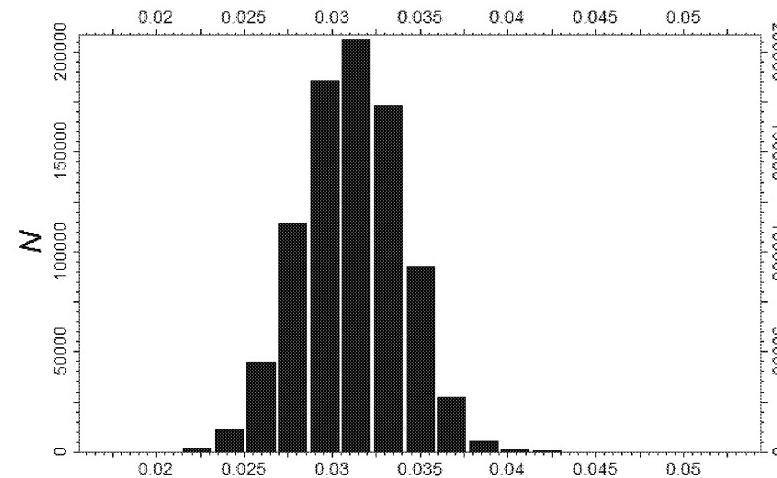
**Schlumberger**



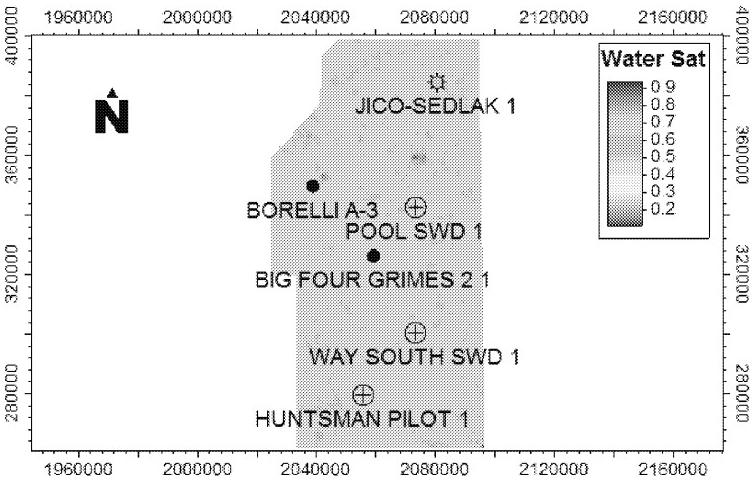
Average PHIT Map for Meramec



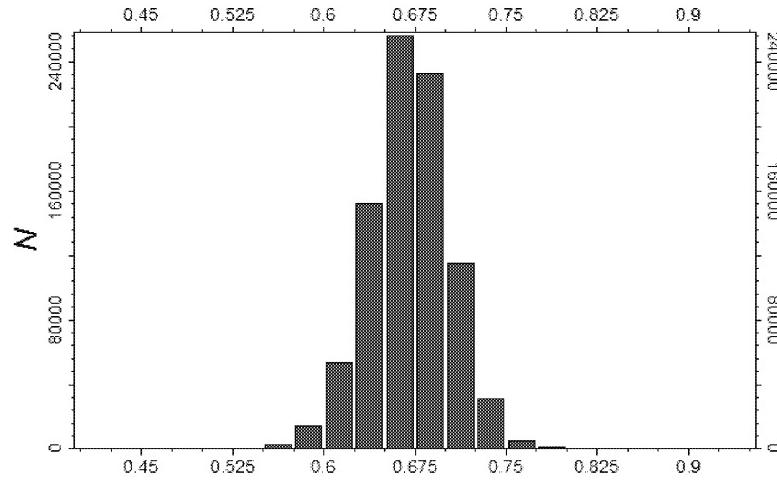
Average PHIT Map for Meramec



Average SW Map for Meramec



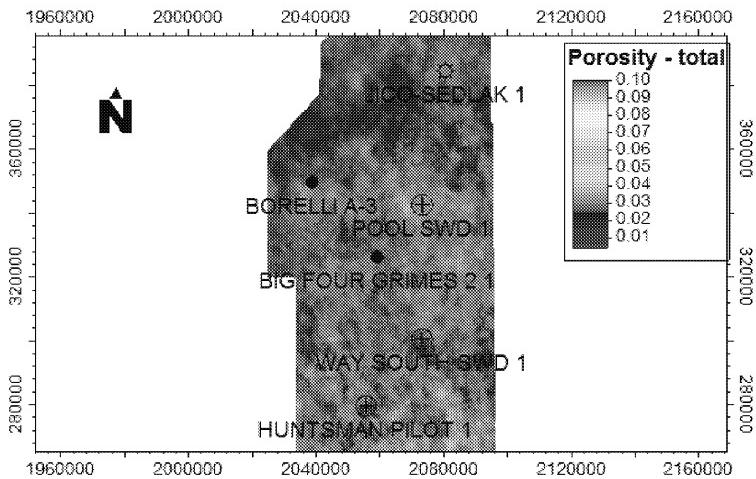
Average SW Map for Meramec



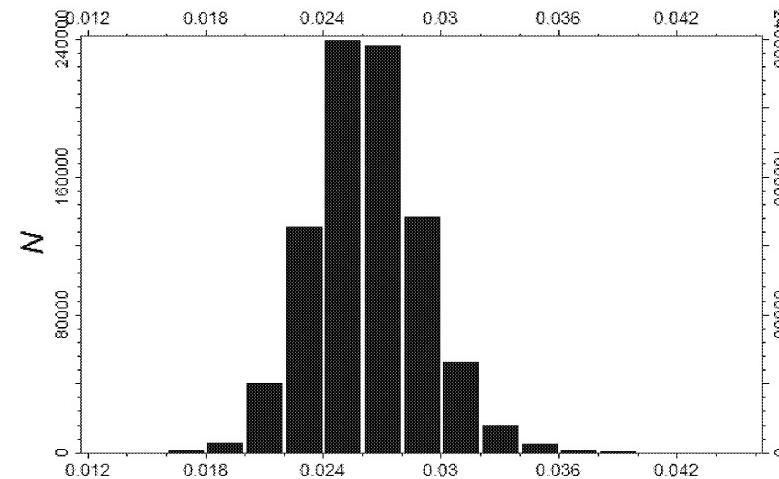
**Schlumberger**



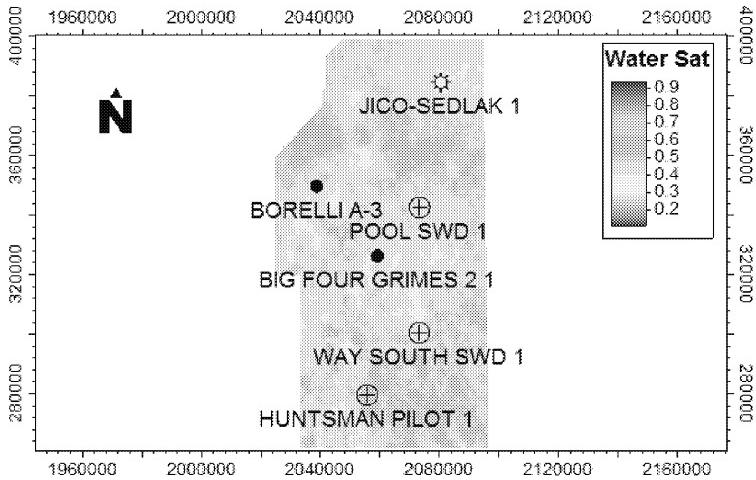
Average PHIT Map for Osage



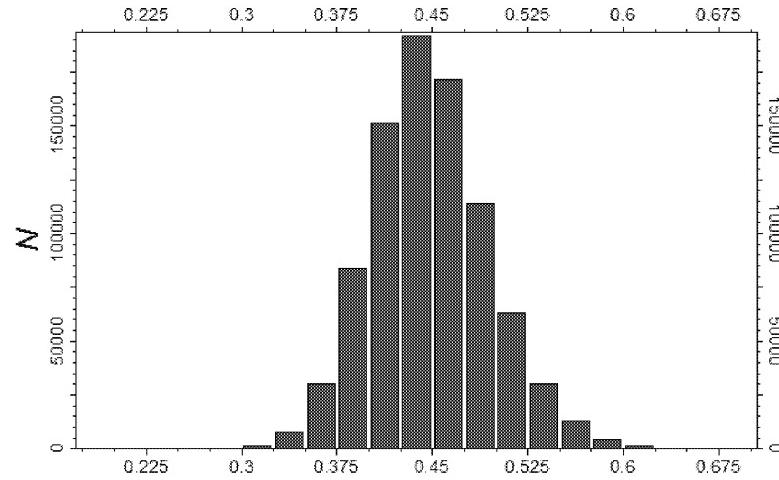
Average PHIT Map for Osage



Average SW Map for Osage



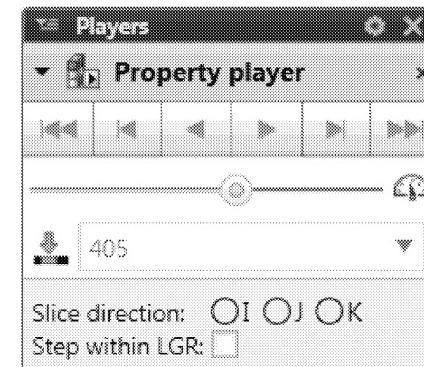
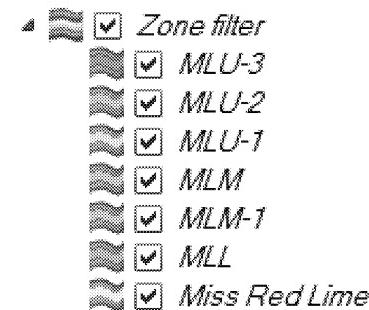
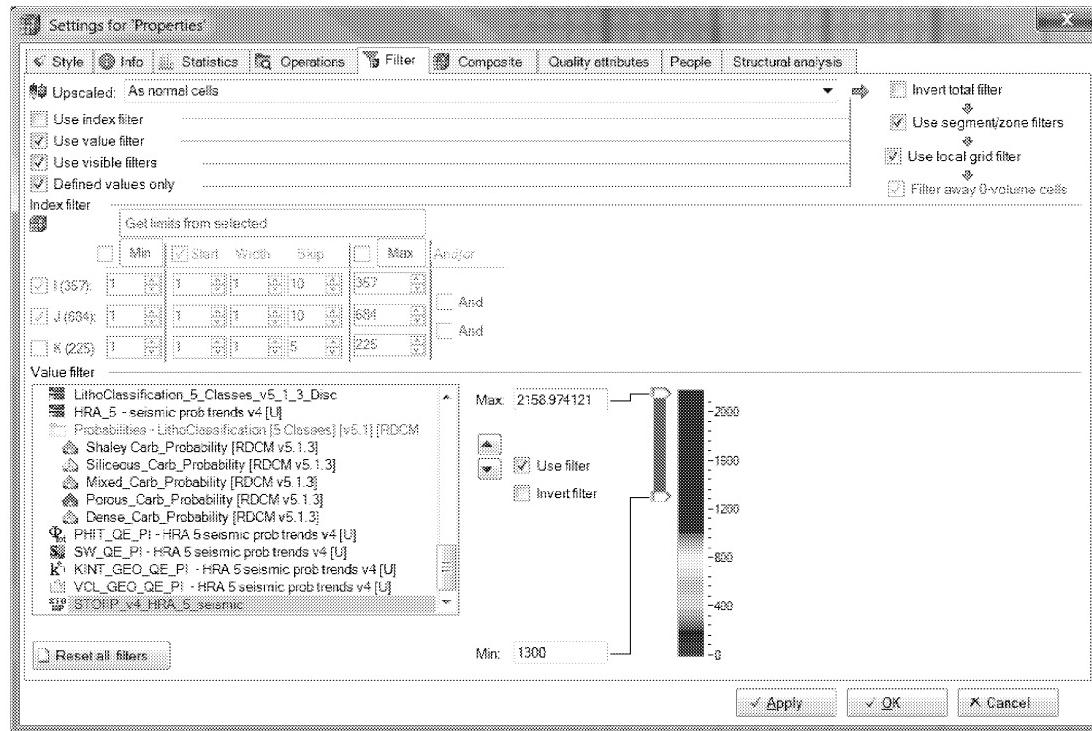
Average SW Map for Osage



**Schlumberger**

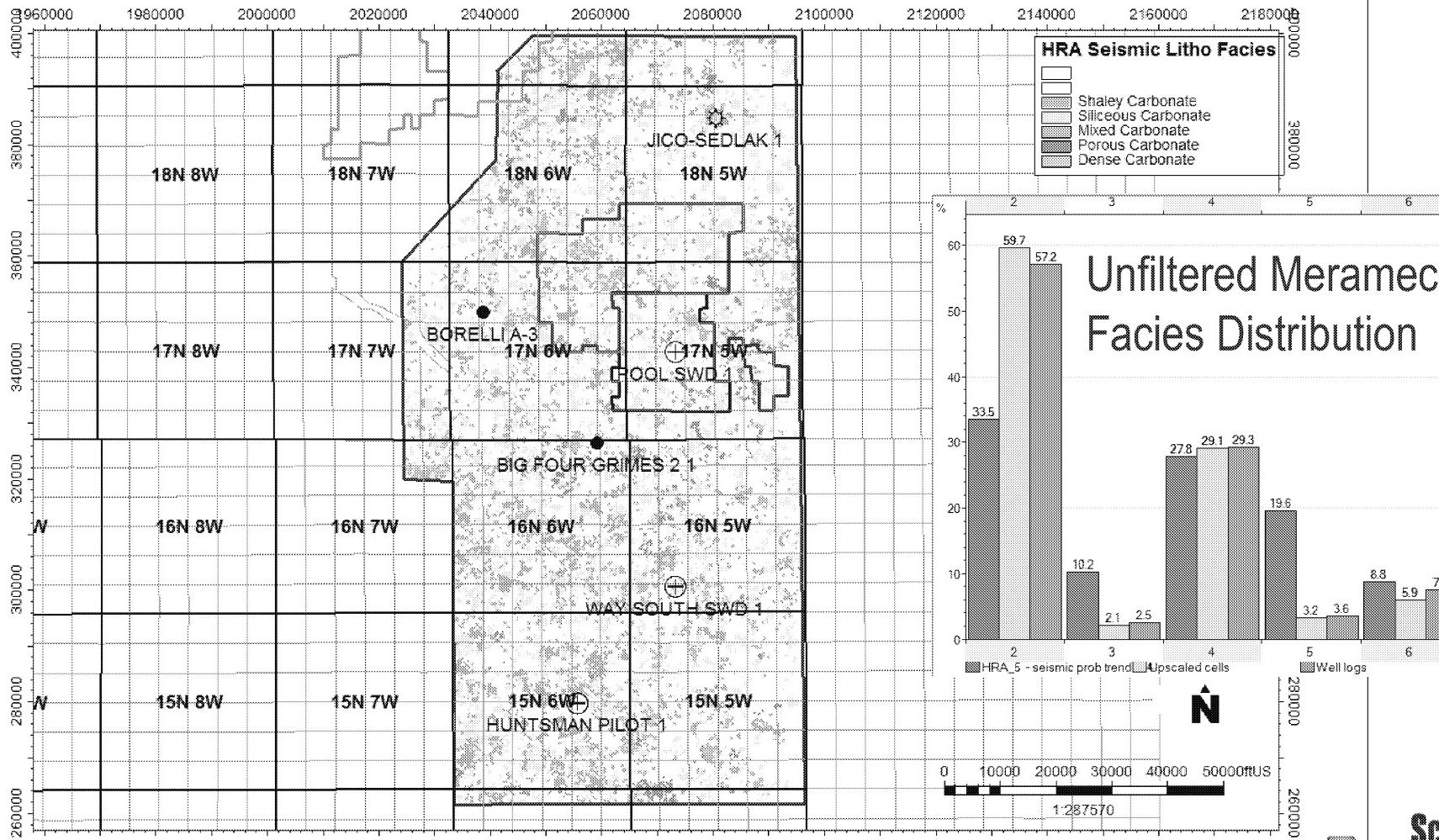


# Filter Properties to Find Sweet Spots and Relationships



**Schlumberger**

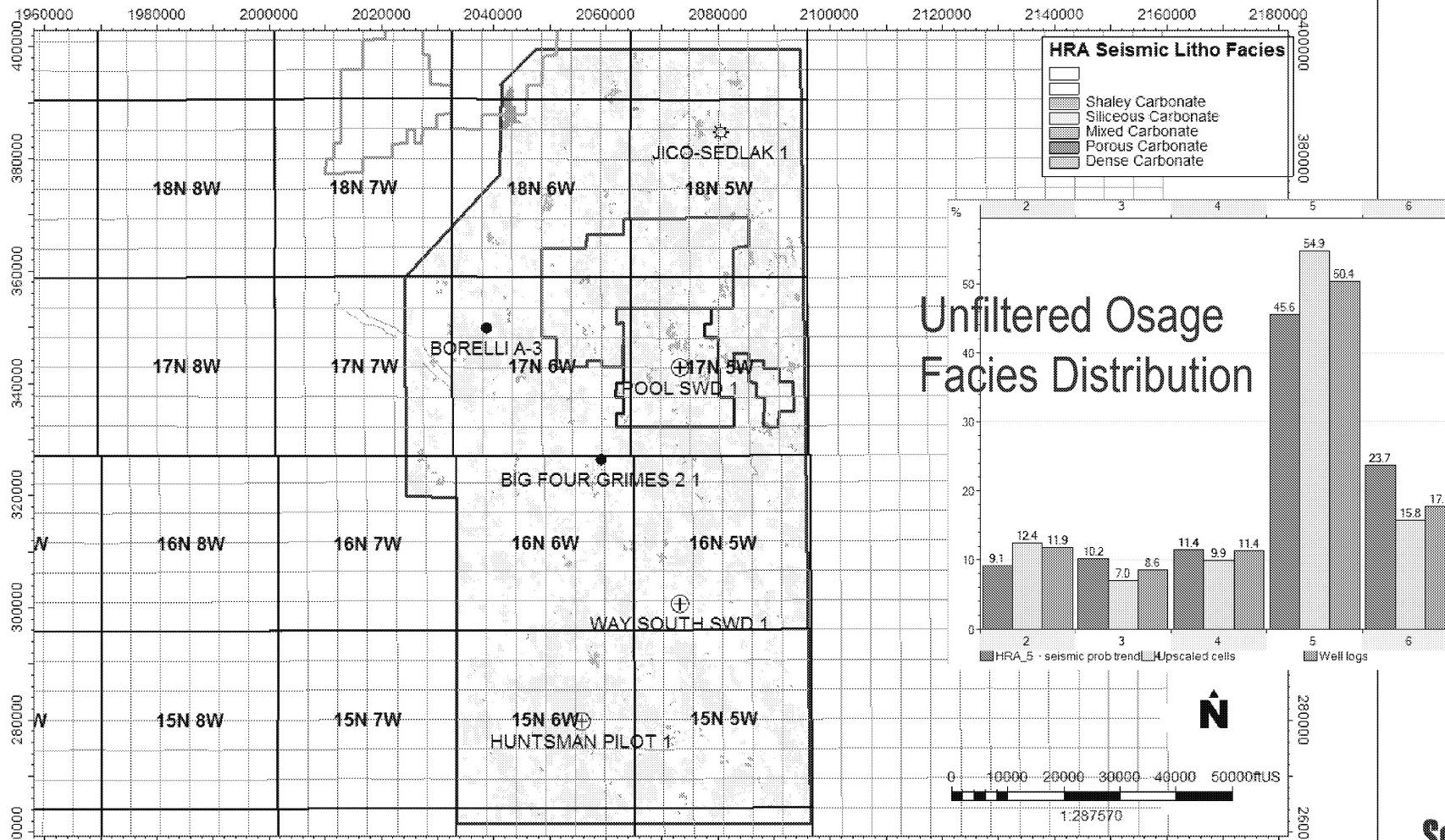
## Meramec Lithology with STOIIP > 1300 STB per cell



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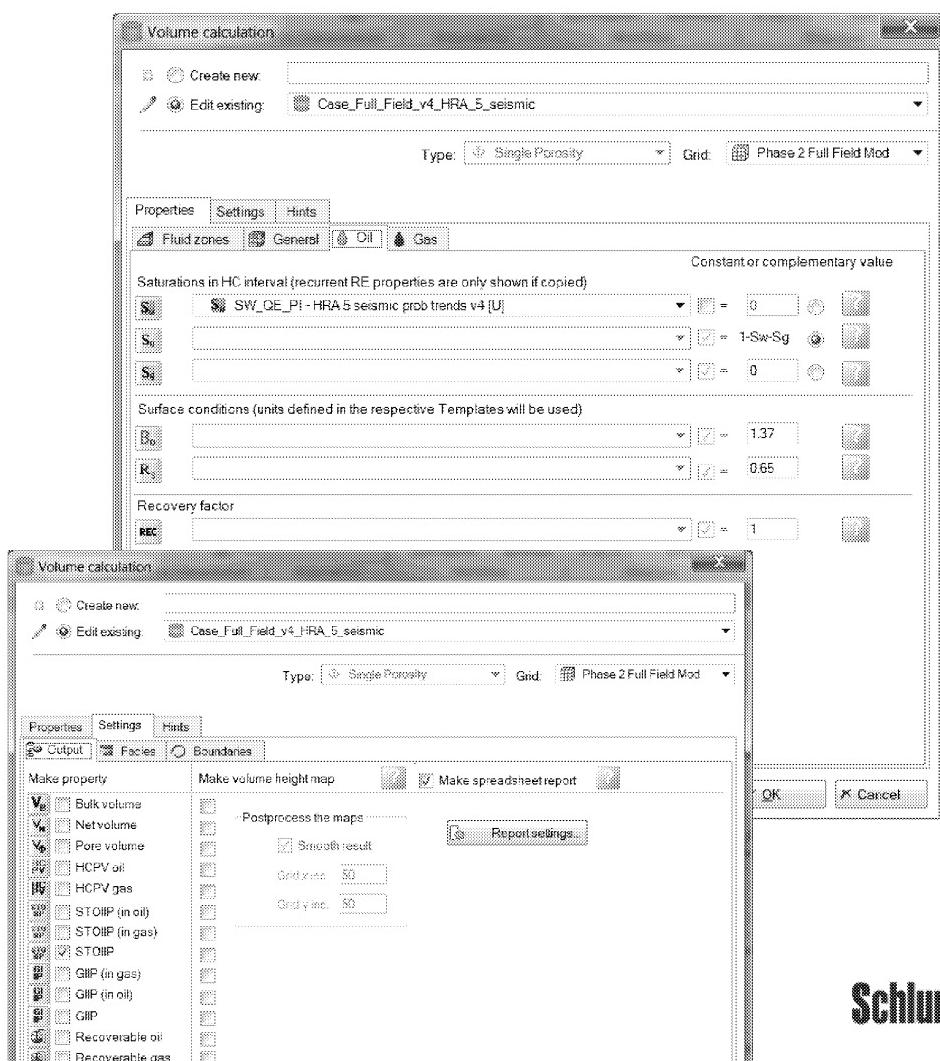
AMR\_SDTX01826920

## Osage Lithology with STOIIP > 1300 STB per cell



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# Volume Calculation Setup



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# Volume Calculation Output

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	A	B	C	D	E	F	G
31							
32 Case	Bulk volume (*10^6 ft3)	Net volume (*10^6 ft3)	Pore volume (*10^6 ft3)	HCPV oil (*10^6 ft3)	HCPV gas (*10^6 ft3)	STOIP (in oil) (*10^6 STB)	STC
33 Case_Full_Field_v4_HRA_5_seismic	3835067	3835067	19527	8528	0	6225	
34							
35 Totals all result types							
36							
37 Zones							
38 MLU-3	473718	473718	3067	1105	0	807	
39 MLU-2	664689	664689	4013	1189	0	668	
40 MLU-1	1020274	1020274	4851	1807	0	1319	
41 MLM	687234	687234	3243	1858	0	1356	
42 MLM-1	777111	777111	3578	2280	0	1655	
43 MLL	105903	105903	419	161	0	117	
44 Miss Red Lime	106137	106137	336	127	0	93	
45							
46 Facies							
47	0	0	0	0	0	0	
48	0	0	0	0	0	0	
49 Shaly Carbonate	868554	868554	6456	2364	0	1726	
50 Siliceous Carbonate	387213	387213	2662	1545	0	1128	
51 Mird Carbonate	763984	763984	3307	914	0	687	
52 Porous Carbonate	1172077	1172077	5235	3065	0	2237	
53 Dense Carbonate	618198	618198	1907	641	0	488	
54							
55 Boundaries							
56 No Boundaries	3835067	3835067	19527	8528	0	6225	
57							
58 Detailed results							
59							

CONFIDENTIAL

AMR\_SDTX01826923

# STOIP Estimates for all Zones and all Facies

All Zones	Bulk volume	Net volume	Pore volume	HCPV oil	STOIP	STOIP per sq mile	Richness
	[*10^6 ft3]	[*10^6 ft3]	[*10^6 RB]	[*10^6 RB]	[*10^6 STB]	[*10^6 STB/sq mile]	[1000*STB/ft3]
	<b>3,835,067</b>	<b>3,835,067</b>	<b>19,491</b>	<b>8,406</b>	<b>6,135</b>	<b>19.53</b>	<b>1.60</b>
<b>Results by Zones</b>							
MLU-3	<b>473,718</b>	<b>473,718</b>	<b>3,111</b>	<b>1,120</b>	<b>817</b>	<b>2.60</b>	<b>1.72</b>
MLU-2	<b>664,689</b>	<b>664,689</b>	<b>4,002</b>	<b>1,185</b>	<b>865</b>	<b>2.75</b>	<b>1.30</b>
MLU-1	<b>1,020,274</b>	<b>1,020,274</b>	<b>4,825</b>	<b>1,773</b>	<b>1,294</b>	<b>4.12</b>	<b>1.27</b>
MLM	<b>687,234</b>	<b>687,234</b>	<b>3,239</b>	<b>1,814</b>	<b>1,324</b>	<b>4.22</b>	<b>1.93</b>
MLM-1	<b>777,111</b>	<b>777,111</b>	<b>3,576</b>	<b>2,238</b>	<b>1,634</b>	<b>5.20</b>	<b>2.10</b>
MLL	<b>105,903</b>	<b>105,903</b>	<b>415</b>	<b>162</b>	<b>118</b>	<b>0.38</b>	<b>1.11</b>
Miss Red Lime	<b>106,137</b>	<b>106,137</b>	<b>323</b>	<b>114</b>	<b>83</b>	<b>0.26</b>	<b>0.78</b>
<b>Results by Facies</b>							
Shaley Carbonate	<b>868,594</b>	<b>868,594</b>	<b>6,497</b>	<b>2,365</b>	<b>1,726</b>	<b>5.49</b>	<b>1.99</b>
Siliceous Carbonate	<b>387,213</b>	<b>387,213</b>	<b>2,682</b>	<b>1,546</b>	<b>1,128</b>	<b>3.59</b>	<b>2.91</b>
Mixed Carbonate	<b>788,984</b>	<b>788,984</b>	<b>3,309</b>	<b>901</b>	<b>658</b>	<b>2.09</b>	<b>0.83</b>
Porous Carbonate	<b>1,172,077</b>	<b>1,172,077</b>	<b>5,232</b>	<b>2,981</b>	<b>2,176</b>	<b>6.93</b>	<b>1.86</b>
Dense Carbonate	<b>618,198</b>	<b>618,198</b>	<b>1,771</b>	<b>613</b>	<b>447</b>	<b>1.42</b>	<b>0.72</b>

# PX 334

**Category:** Chats/Private [REDACTED]

**From:** Hal Chappelle

**To:** Tim Turner

**Timestamp:** 5/27/2018 7:56:19 PM -04:00

**Type:** iMessage

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Thanks, Tim

Mike thinks our patterns will average 150 MBO and 7 wells

I told him we need to focus this year's activities on increasing / maximizing production ... that it's early ... and that you have done a lot of work to understand this, too

Exhibit  
CP- 0737  
Chappelle

**Category:** Chats/Private [REDACTED]

**From:** Tim Turner

**To:** Hal Chappelle

**Timestamp:** 5/27/2018 8:02:07 PM -04:00

**Type:** iMessage

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150/7 is a pretty blanket statement. Seems it will be driven by OOIP and production method.

**Category:** Chats/Private [REDACTED]

**From:** Hal Chappelle

**To:** Tim Turner

**Timestamp:** 5/27/2018 8:03:38 PM -04:00

**Type:** iMessage

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Yes ... and I said we are just learning the impact of having SO MUCH WATER in the system

We just can't be connecting all the reservoir with a small # of wells

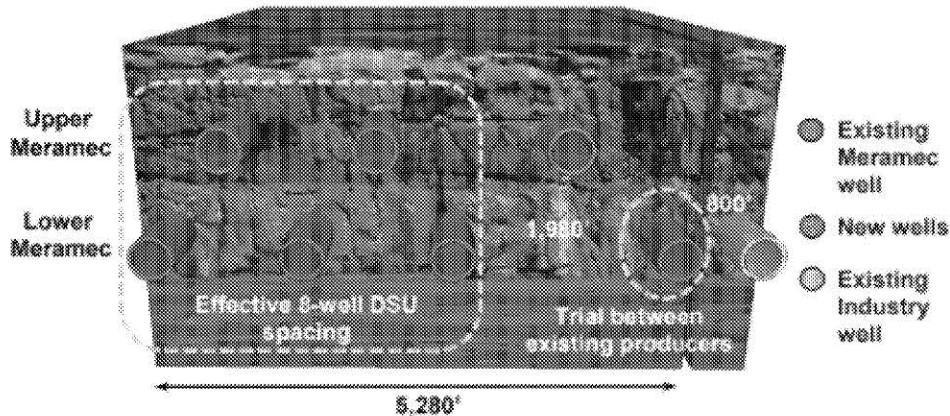
# PX 335

**From:** Tim Turner [/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=B1DAFB3D94C349659C912993A8BEE9DF-TIM TURNER]  
**Sent:** 7/20/2018 5:21:45 PM  
**To:** Hal H. Chappelle [hchappelle@altamesa.net]; Scott Grandt [sgrandt@altamesa.net]  
**CC:** Michael A. McCabe [mmccabe@altamesa.net]; Lance Weaver [lweaver@altamesa.net]  
**Subject:** RE: Investor Calls Today

Very much agree with that statement. In addition, as we have said, 12 wells per section is a proxy for recovering 8% of an average 35 MMBO/section assuming 250 MBO/well. We have also said OOIP across our footprint varies from about 15-50 MMBO/section.

The following statements may or may not make sense to share publicly due to competition, but I offer the following: To the south, OOIP is generally smaller. For instance, in MRO's Hansens pad in Sec 12-16N-7W, we map a total of ~20 MMBO in place. About 10 MMBO in the Meramec and 10 MMBO in the Osage. They don't seem to have caught on to the fact that the Osage works and gravity drainage plays a big part in the reservoir drive. So, basically, at 8% recovery, I would expect to recover about 800 MBO from the Meramec. They drilled a parent Meramec well and then 6 infill wells in the Meramec only. So, you might expect recovery of  $800/7 = 110$  MBO/well.

### Hansens Meramec SL Infill Pilot



**From:** Hal H. Chappelle  
**Sent:** Friday, July 20, 2018 4:47 PM  
**To:** Scott Grandt <sgrandt@AltaMesa.net>  
**Cc:** Michael A. McCabe <mmccabe@AltaMesa.net>; Lance Weaver <lweaver@AltaMesa.net>; Tim Turner <tturner@AltaMesa.net>  
**Subject:** Re: Investor Calls Today

On number of wells it's just too early to tell

We can work on the long and see

Sent from my iPhone

On Jul 20, 2018, at 4:42 PM, Scott Grandt <sgrandt@AltaMesa.net> wrote:

Orbis call notes below:

Short interest discussion was just him asking if we'd heard any ideas why it was growing? Talked about shorts related to the warrants. He had heard some people were increasingly doing a pair trade (short AMR, long NFX) into earnings with the expectation of their relative outperformance of us within the basin. That was ~15 min of the call.

**Exhibit  
CP- 0198**

3/23/2023  
Turner

The other 15 minutes he wanted to talk about MRO in the normal pressure vs. us. We had spoken with him about it right after the Q1 call and he just wanted to re-hash what we had told him (lower costs key driver in seeing better returns) and see if we saw any price inflation that was changing that story. Talked about improved efficiencies helping us keep our total costs fairly flat. One question he had, that I told him we'd come back to him on was MRO has been talking about 6 wells per section in the normal pressure area vs. us saying 12. Do we think the difference is driven by their view of OOIP vs. ours or completion design or some other factor? I'm adding Tim to this in case he has a view / has looked at their disclosure. I stated the 12 we have is based on starting with a view of OOIP and then applying a recovery factor and dividing by EUR per well. He remembered that from the road show and appreciated the reminder. If we have any specific insight into why we thought we were different from MRO estimates we can circle back, but not urgent to him, just more curiosity.

-Scott

---

**From:** Scott Grandt  
**Sent:** Friday, July 20, 2018 1:40 PM  
**To:** Hal H. Chappelle <[hchappelle@AltaMesa.net](mailto:hchappelle@AltaMesa.net)>  
**Cc:** Michael A. McCabe <[mmccabe@AltaMesa.net](mailto:mmccabe@AltaMesa.net)>; Lance Weaver <[lweaver@AltaMesa.net](mailto:lweaver@AltaMesa.net)>  
**Subject:** RE: Investor Calls Today

A good idea from the Point72 call...

Michael suggested we have a slide in the deck around our take away / basis / hedging of basis. With so much noise on the Permian side starting to trickle over other places, proactively addressing it in our own pack as a point of strength could be helpful.

Otherwise wasn't much of a call. Talked about the GS report a bit.

-Scott

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**From:** Hal H. Chappelle  
**Sent:** Friday, July 20, 2018 8:19 AM  
**To:** Scott Grandt <[sgrandt@AltaMesa.net](mailto:sgrandt@AltaMesa.net)>  
**Cc:** Michael A. McCabe <[mmccabe@AltaMesa.net](mailto:mmccabe@AltaMesa.net)>; Lance Weaver <[lweaver@AltaMesa.net](mailto:lweaver@AltaMesa.net)>  
**Subject:** Re: Investor Calls Today

Thanks. Agree based on this. Appreciate the info.

Sent from my iPhone

On Jul 20, 2018, at 8:15 AM, Scott Grandt <[sgrandt@AltaMesa.net](mailto:sgrandt@AltaMesa.net)> wrote:

Given the topics I feel comfortable handling both.

---

**From:** Michael A. McCabe  
**Sent:** Friday, July 20, 2018 8:15 AM  
**To:** Scott Grandt <[sgrandt@AltaMesa.net](mailto:sgrandt@AltaMesa.net)>

**Cc:** Hal H. Chappelle <[hchappelle@AltaMesa.net](mailto:hchappelle@AltaMesa.net)>; Lance Weaver <[lweaver@AltaMesa.net](mailto:lweaver@AltaMesa.net)>  
**Subject:** Re: Investor Calls Today

Let us know who, if anyone, needs to be on these calls

Sent from my iPhone

On Jul 20, 2018, at 8:07 AM, Scott Grandt <[sgrandt@AltaMesa.net](mailto:sgrandt@AltaMesa.net)> wrote:

As a heads up two calls with our bigger long only's got scheduled yesterday evening for later this afternoon:

- 1) Orbis (3PM) – Shot us a note just wants to connect on the short interest. Made a point of don't want to connect on operations or anything that would tip off earnings. Our short interest has ticked up modestly from the ~10% area to the 15% area over the past month. Only rumor we've heard from our stock watch is that people are positioning for a negative earnings surprise. I am not going to repeat that rumor on this call.
- 2) Point72 (1PM) – Michael Suefer just wanted to connect after our call with Romany Feldman on Tuesday (one of the other analysts). I think it's just going to be a 10 min check in.

Think both will be pretty brief but given the shareholders wanted to proactively flag the calls for you both.

-Scott

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Scott Grandt  
Vice President Finance and Investor Relations  
Alta Mesa Resources, Inc.  
O: 281-945-3357  
[REDACTED]

[sgrandt@altamesa.net](mailto:sgrandt@altamesa.net)

# PX 336

**From:** Lance Weaver <lweaver@AltaMesa.net> on behalf of Lance Weaver <lweaver@AltaMesa.net>  
**Sent:** Friday, July 20, 2018 3:22 AM  
**To:** Kevin J. Bourque <kbourque@AltaMesa.net>  
**Subject:** Re: Notes from NYC portion of Imperial NDR - Thursday

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No

On Jul 19, 2018, at 10:19 PM, Kevin J. Bourque <kbourque@AltaMesa.net> wrote:

ESPs only affect rate, not EUR. Be careful with that.

Sent from my Android phone using TouchDown ([www.symantec.com](http://www.symantec.com))

-----Original Message-----

**From:** Lance Weaver [lweaver@AltaMesa.net]  
**Received:** Thursday, 19 Jul 2018, 22:15  
**To:** Hal H. Chappelle [hchappelle@AltaMesa.net]  
**CC:** Jim Hackett [jhackett@AltaMesa.net]; Scott Grandt [sgrandt@AltaMesa.net]; Kevin J. Bourque [kbourque@AltaMesa.net]; Tim Turner [tturner@AltaMesa.net]; Craig Collins [CCollins@kingfishermidstream.net]; Michael A. McCabe [mmccabe@AltaMesa.net]; Tamara Alsarraf [talsarraf@AltaMesa.net]  
**Subject:** RE: Notes from NYC portion of Imperial NDR - Thursday

Early stages of testing/implementing use of ESP. Discussed pros/cons of their use and optimal time to install them (post sand issues) and at what stage in the life of the well – typically later vs earlier in life of well. Discussed use by other operators vs gas lift and the possible/probable negative impact on EUR despite higher IP rates. Use of the ESP has good/great possible rate impact and we were cautiously optimistic as to their wider use in the play.

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**From:** Hal H. Chappelle  
**Sent:** Thursday, July 19, 2018 10:05 PM  
**To:** Lance Weaver <lweaver@AltaMesa.net>  
**Cc:** Jim Hackett <jhackett@AltaMesa.net>; Scott Grandt <sgrandt@AltaMesa.net>; Kevin J. Bourque <kbourque@AltaMesa.net>; Tim Turner <tturner@AltaMesa.net>; Craig Collins <CCollins@kingfishermidstream.net>; Michael A. McCabe <mmccabe@AltaMesa.net>; Tamara Alsarraf <talsarraf@AltaMesa.net>  
**Subject:** Re: Notes from NYC portion of Imperial NDR - Thursday

Thanks

You mentioned ESPs a couple of times ... what did you say?

Sent from my iPhone

On Jul 19, 2018, at 9:57 PM, Lance Weaver <lweaver@AltaMesa.net> wrote:

Imperial Capital NDR – New York – Thursday 07/19/18

Hewes Funds – Matt Dinusson - New addition to Hewes team – brought on board by PM

Travis Meyers.

Broadly familiar with the AMR so brought him more up to speed on the story. Discussed KFM third party status and activity, impact of ESP's, review of Major county, LOE. Seeking 2018 exit rate. Cost inflation concerns, CE pipeline – cost, timing and impact on revenue. Rig cadence for 2018 & 19. Consider stock repurchase?

Hewes holds ~ 2mm shares w/ ~\$9 basis

Spectrum Group – Brian Asby, Shawn Shivalkar - Hedge fund – equity and credit, not current holders

Review of Q1 hiccups, MRO issue and impact on STACK producers, Major county discussion - first well, 5-6 total, expectations are good. What does 2018-19 look like in Major county? Acreage acquisition, 4,200 locations – is this enough? Review of balance sheet, KFM financials. CE pipeline - economic benefit for upstream and KFM? KFM dropdown, Three revenue streams on KFM, oil, gas, water. Distressed investors.

Question for them: What's the hair on our story, that keeps you from taking a position? - Not a clean story, more complex than competing investment opportunities, need more coverage and clarity.

Jennison – Neil Brown, Matt ?

KFM update, CE pipeline discussion and economics, KFM revenue streams – oil, gas & water, explain and promote water portion. GS report review – too conservative. Major county activity, rig cadence, M&A opportunities. Messy accounting issues in Q1. We mentioned change from BDO to KPMG – could not care less. ESP usage and impact. Drilling pad discussion, BCE discussion, Confirm and explain softness of KFM third party activity. KFM dropdown options – mid-2019. NGL prices, Conway vs Mt B – should we be concerned? (note that several groups brought this up). Frac sand supply – no issues – explained why, Balance sheet discussion, Hedges discussion. They like Derrick Whitfield's analysis and conclusions.

York Capital – Thanasi Skafidas +1 (Ryan?)

Where is Scott Grandt – his former boss at GS? STACK knowledge was high. Investors in other PE backed STACK producers (sp? Millinium, Linn, Gastar, Roan, Riviera Resources (Linn?), 84K acres? They know the area very well, but oddly not much about AMR. Cash burn in 18? Trading at 4x ebitda. KFM built for flow assurance, review of upstream asset history, infrastructure solid, SWD becoming a profit center, CE pipeline and impact, rig cadence, Major county overview and possibilities, discussion of corporate structure, KFM dropdown, inlet capacity, review of KFM guidance, NGL options – Conway vs Mt B - explain. Do you want/need to maintain control of KFM? Talloak discussion, add another train if needed, multi pad drilling, issues on taking wells offline for fracing? What does 2020 look like for KFM, AMR? Explain non-consent issues - because of budgets. Explain AMR formation and base business plan. Share liquidity concerns – impact of Riverstone share lockup. Hedging philosophy and review. Mike discusses SWD issues in the stack and promotes KFM three stream advantage.

Walked away with impression they will be doing a deeper dive on AMR.

Fir Tree – Andrew Teno (video call from Miami) Holders at average of \$7, level?

Review of messy accounting numbers for Q1, STACK drilling cadence 8 rigs, multi well pad drilling, 4 wells per pad to maximize production in 18 lower working capital. 2019 guidance – when? Review of capex, 1 mile vs 2 mile and numbers of stages, Osage vs Merrimack. Review of moving assets from other basins STACK. Message from Mike, delayed start for public co, dropped rigs to 5 at YE 17, so 4-6 months behind, waiting to show 2-3 Q's of execution. Fighting myths of normal pressure stack not being economic. Review of gas take away options and issues, do we use ARM? Lockup ended – impact? M&A strategy and process, liquidity

discussion and debt, borrowing base review. KFM growth - seeing any increase in activity? Producers are capital constrained, Gastar impaired, Chisum 3 rigs, KFM dropdown, MLP or C Corp? KFM ebitda needed to IPO?

TCW Group – Diane Jaffee

Overview of company and assets – company history + merger story. SWD discussion and revenue stream. STACK vs Permian – size, scale, limited expansion? Normal vs overpressured area - explain. Seismic activity – issue for AMR? Multi-well pad drilling – pros/cons. Hackett role and current duties. AMR gearing up for growth – corp structure & ops. Capex review, Messy Q1 accounting – explain. Goal of being CF positive by 2019. M&A opportunities. Own, follow Newfield. Liquidity concerns. Mike misspoke on a couple of production stats as he was clearly distracted by Gigi the modelesque finance intern in attendance who he swears was giving him “the eye”.

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**From:** Lance Weaver

**Sent:** Wednesday, July 18, 2018 11:09 PM

**To:** Hal H. Chappelle <[hchappelle@AltaMesa.net](mailto:hchappelle@AltaMesa.net)>; Jim Hackett <[jhackett@AltaMesa.net](mailto:jhackett@AltaMesa.net)>; Scott Grandt <[sgrandt@AltaMesa.net](mailto:sgrandt@AltaMesa.net)>

**Cc:** Michael A. McCabe <[mmccabe@AltaMesa.net](mailto:mmccabe@AltaMesa.net)>

**Subject:** Notes from Boston portion of Imperial NDR

Berylson Capital - Nick Nesta

Great meeting, discussion and review of the following: Company history, former assets and current assets, midstream, production, frac options, M&A opportunities, SPAC, Hackett, KFM, value of current and future infrastructure, Capex. They have a deep history of worldwide oil & gas investments, was impressed with our story.

Geode Capital - Ted Blake - holders of a “few hundred thousand shares” with additional capacity.

Discussion and review of the following: midstream ebitda run rate, water transport and revenue opportunities, \$0.15 cost, vs \$1.00 charge, Cimarron Pipeline discussion, \$1-2 per bbl price premium with 40-42 API oil, GS research discussion – conservative estimates, rig cadence, 8 this year going to 10+ in 2019. Mike reiterated the midstream water revenue opportunity and that gas take away will not be an issue for us. Ted, “Everything is looking pretty good and that now we need to execute”. He will review and consider additional investment after 2Q, also looking to see ramp up in coverage. Execution on upstream, traction on midstream, buy more stock.

Highfield Capital - Dan Farb, Garrett Z.

Discussion on production guidance, cadence of drilling and completing, pro/con on additional rigs above current level for 2018. Gas take away issues, review of GS report, midstream discussion, revenue streams – oil, gas, water (\$1/bbl revenue vs \$0.15 cost). If other midstream third party players are weak, is AMR weak? Discussion and confirmation of midstream guidance

Putnam – David Diamond+2 Hold bonds and some equity

Review of capital structure – bonds & borrowing base, Capex for 2018, Hedges for 2018-19, M&A strategy and opportunities, Major county and MRO wells. Where is KFM relative to original plan? Cimarron Express, SWD opportunities, ESP upside and impact, What does the company look like five years from now? Can you eventually live within cash flow? Exit rate for 2018?

Wellington – Greg LeBlanc, Steve Angeli + 1

Detailed KFM review and discussion, KFM original plan vs current plan, Original third party producers plans vs current plans, Capex for KFM 18&19, Review of KFM revenue streams – oil, gas, water. NGL prices. Pad drilling well results – parent/child relationship/issues. Service cost inflation? Balance sheet review and hedge. Seismic concerns? KFM IPO timing and options. Would like to see better, and more recent third party confirmable well production data each quarter, or at least at mid-year.

Hite Hedge - Dan Neuman, Andy Gupta, Matt Niblack

Review reason for merger delay and related impact on third party production. Current guidance, Balance sheet discussion, M&A options/competition, Private equity issues. Acquisition criteria for acreage/leases. Valuation misconception discussion, ESP impact, service cost, pro/con of additional rigs above current level, Jim Hackett role/duties.

Crow Point – Tim O'Brian & Bert Andernie,

Gastar preferred holders, discussion of KFM dropdown plans, gas contracts, cash levels and debt, why fire BDO? Production mix.

Lance Weaver  
Director of Investor Relations  
Alta Mesa Resources  
[lweaver@altamesa.net](mailto:lweaver@altamesa.net)  
[REDACTED]

**PX 337**

**REDACTED IN ITS ENTIRETY**

**PX 338**

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**From:** Tim Turner [tturner@AltaMesa.net]  
on behalf of Tim Turner <tturner@AltaMesa.net> [tturner@AltaMesa.net]  
**Sent:** 12/26/2017 3:12:30 PM  
**To:** Mike E. Ellis [mellis@AltaMesa.net]  
**Subject:** Fwd: Lets stay away from the two eastern sections in 16-5. BUT lets not give up on 15-5.

And my inherent assumption in this is the layers are consistent. Even that is probably wrong.

Tim

Begin forwarded message:

**From:** Tim Turner <tturner@AltaMesa.net>  
**Date:** December 26, 2017 at 3:05:26 PM CST  
**To:** "Mike E. Ellis" <mellis@AltaMesa.net>  
**Subject:** Re: Lets stay away from the two eastern sections in 16-5. BUT lets not give up on 15-5.

Agree. There's a lot we don't know!

Tim

On Dec 26, 2017, at 3:03 PM, Mike E. Ellis <mellis@AltaMesa.net> wrote:

The Eagleford is where the industry realized how important rock typing is. Some rocks maybe 1% recovery. Some maybe 15%. I am not saying that you are wrong. We just need to understand that we don't know.

**From:** Tim Turner  
**Sent:** Tuesday, December 26, 2017 3:01 PM  
**To:** Mike E. Ellis <mellis@AltaMesa.net>  
**Subject:** Re: Lets stay away from the two eastern sections in 16-5. BUT lets not give up on 15-5.

Just making the observation that the lower Osage has a very low OOIP in this area. Assuming 8% rec efficiency and 160 acre drainage area, Old Crab and Sadiebug likely draining from upper layers which may be connected naturally or induced. Other wells to the east don't appear to be connected to upper layers due to low productivity.

Tim

On Dec 26, 2017, at 2:41 PM, Mike E. Ellis <mellis@AltaMesa.net> wrote:

But how do you know they match? If the two best laterals are in the Lower Osage?

**From:** Tim Turner  
**Sent:** Tuesday, December 26, 2017 2:40 PM  
**To:** Mike E. Ellis <mellis@AltaMesa.net>  
**Subject:** Re: Lets stay away from the two eastern sections in 16-5. BUT lets not give up on 15-5.

Should say matching.

Tim

On Dec 26, 2017, at 1:22 PM, Tim Turner <tturner@AltaMesa.net> wrote:

Yes, OIP marching up to higher EUR.

Tim

On Dec 26, 2017, at 1:19 PM, Mike E. Ellis <[mellis@AltaMesa.net](mailto:mellis@AltaMesa.net)> wrote:

You mean OIP don't you?

**From:** Tim Turner

**Sent:** Tuesday, December 26, 2017 1:14 PM

**To:** Mike E. Ellis <[mellis@AltaMesa.net](mailto:mellis@AltaMesa.net)>

**Subject:** Re: Lets stay away from the two eastern sections in 16-5. BUT lets not give up on 15-5.

Correct, but oil EUR suggests most prod is from upr Osage/lwr Meramec.

Tim

On Dec 26, 2017, at 12:57 PM, Mike E. Ellis <[mellis@AltaMesa.net](mailto:mellis@AltaMesa.net)> wrote:

The Old Crab and the Sadiebug are the only two 300 mbo wells in 15N or 16N (between all four townships). Both are Lower Osage laterals. Correct?

**From:** Tim Turner

**Sent:** Tuesday, December 26, 2017 12:54 PM

**To:** Mike E. Ellis <[mellis@AltaMesa.net](mailto:mellis@AltaMesa.net)>; Kerima Haddad <[khaddad@AltaMesa.net](mailto:khaddad@AltaMesa.net)>; Gene Cole <[gcole@AltaMesa.net](mailto:gcole@AltaMesa.net)>; Kevin J. Bourque <[kbourque@AltaMesa.net](mailto:kbourque@AltaMesa.net)>

**Cc:** Hal H. Chappelle <[hchappelle@AltaMesa.net](mailto:hchappelle@AltaMesa.net)>; F. David Murrell <[dmurrell@AltaMesa.net](mailto:dmurrell@AltaMesa.net)>; Patrick Bolgren <[PBolgren@AltaMesa.net](mailto:PBolgren@AltaMesa.net)>; Abbas Belyadi <[ABelyadi@AltaMesa.net](mailto:ABelyadi@AltaMesa.net)>; Alex Husser <[AHusser@AltaMesa.net](mailto:AHusser@AltaMesa.net)>; Sean Rosenfeld <[srosenfeld@AltaMesa.net](mailto:srosenfeld@AltaMesa.net)>; Cathy Radvansky <[cradvansky@AltaMesa.net](mailto:cradvansky@AltaMesa.net)>; David M. Smith <[dsmith@AltaMesa.net](mailto:dsmith@AltaMesa.net)>; Kevin A. Logan <[klogan@AltaMesa.net](mailto:klogan@AltaMesa.net)>; Erick Nefe <[enefe@AltaMesa.net](mailto:enefe@AltaMesa.net)>; Hector L. Caram <[hcaram@AltaMesa.net](mailto:hcaram@AltaMesa.net)>; John E. Mason <[jmason@AltaMesa.net](mailto:jmason@AltaMesa.net)>; Kathy Sheen <[ksheen@AltaMesa.net](mailto:ksheen@AltaMesa.net)>

**Subject:** RE: Lets stay away from the two eastern sections in 16-5. BUT lets not give up on 15-5.

From a volumetric standpoint, it seems the best opportunities here are in the Lwr Meramec and Upr Osage. I believe all of these wells are landed at the bottom of the Lwr Osage which may be a reason they are economic, but relatively poor. Noting the Old Crab seems to be an exception as it's probably producing oil from above the Lwr Osage, but this doesn't seem to be the rule.

**From:** Mike E. Ellis

**Sent:** Tuesday, December 26, 2017 11:03 AM

**To:** Kerima Haddad <[khaddad@AltaMesa.net](mailto:khaddad@AltaMesa.net)>; Gene Cole <[gcole@AltaMesa.net](mailto:gcole@AltaMesa.net)>; Kevin J. Bourque <[kbourque@AltaMesa.net](mailto:kbourque@AltaMesa.net)>; Tim Turner <[tturner@AltaMesa.net](mailto:tturner@AltaMesa.net)>

**Cc:** Hal H. Chappelle <[hchappelle@AltaMesa.net](mailto:hchappelle@AltaMesa.net)>; F. David Murrell <[dmurrell@AltaMesa.net](mailto:dmurrell@AltaMesa.net)>; Patrick Bolgren <[PBolgren@AltaMesa.net](mailto:PBolgren@AltaMesa.net)>; Abbas Belyadi <[ABelyadi@AltaMesa.net](mailto:ABelyadi@AltaMesa.net)>; Alex Husser <[AHusser@AltaMesa.net](mailto:AHusser@AltaMesa.net)>; Sean Rosenfeld <[srosenfeld@AltaMesa.net](mailto:srosenfeld@AltaMesa.net)>; Cathy Radvansky <[cradvansky@AltaMesa.net](mailto:cradvansky@AltaMesa.net)>; David M. Smith <[dsmith@AltaMesa.net](mailto:dsmith@AltaMesa.net)>; Kevin A. Logan <[klogan@AltaMesa.net](mailto:klogan@AltaMesa.net)>; Erick Nefe <[enefe@AltaMesa.net](mailto:enefe@AltaMesa.net)>; Hector L. Caram <[hcaram@AltaMesa.net](mailto:hcaram@AltaMesa.net)>; John E. Mason <[jmason@AltaMesa.net](mailto:jmason@AltaMesa.net)>; Kathy Sheen <[ksheen@AltaMesa.net](mailto:ksheen@AltaMesa.net)>

**Subject:** RE: Lets stay away from the two eastern sections in 16-5. BUT lets not give up on 15-5.

I think you make a great point. Maybe the NE half of 15-5 will be OK. So far we have zero wells there. I was using the Prue Unit well (85 mbo) as a negative, but that is a Generation 1 well, so maybe not appropriate.

---

**From:** Kerima Haddad

**Sent:** Tuesday, December 26, 2017 10:06 AM

**To:** Mike E. Ellis <mellis@AltaMesa.net>; Gene Cole <gcole@AltaMesa.net>; Kevin J. Bourque <kbourque@AltaMesa.net>; Tim Turner <tturner@AltaMesa.net>  
**Cc:** Hal H. Chappelle <hchappelle@AltaMesa.net>; F. David Murrell <dmurrell@AltaMesa.net>; Patrick Bolgren <PBolgren@AltaMesa.net>; Abbas Belyadi <ABelyadi@AltaMesa.net>; Alex Husser <AHusser@AltaMesa.net>; Sean Rosenfeld <srosenfeld@AltaMesa.net>; Cathy Radvansky <cradvansky@AltaMesa.net>; David M. Smith <dsmith@AltaMesa.net>; Kevin A. Logan <klogan@AltaMesa.net>; Erick Nefe <enefe@AltaMesa.net>; Hector L. Caram <hcaram@AltaMesa.net>; John E. Mason <jmason@AltaMesa.net>; Kathy Sheen <ksheen@AltaMesa.net>  
**Subject:** RE: Lets stay away from the two eastern sections in 16-5. BUT lets not give up on 15-5.

The one thing I would note is that as you move south east in 15 05 it gets really thin ~ 200 and much higher structurally .

The northern eastern sections in 1605 are much more similar to southern 1705 . Are you just talking about the southern eastern sections in 1605 or the whole east side ?

*Kerima L. Haddad*

Alta Mesa Holdings  
888 Oakwood Road , Suite 220  
Charleston , WV 25314  
Office - 304-205-0444

**From:** Mike E. Ellis

**Sent:** Tuesday, December 26, 2017 10:41 AM

**To:** Gene Cole <gcole@AltaMesa.net>; Kevin J. Bourque <kbourque@AltaMesa.net>; Tim Turner <tturner@AltaMesa.net>

**Cc:** Hal H. Chappelle <hchappelle@AltaMesa.net>; F. David Murrell <dmurrell@AltaMesa.net>; Patrick Bolgren <PBolgren@AltaMesa.net>; Abbas Belyadi <ABelyadi@AltaMesa.net>; Alex Husser <AHusser@AltaMesa.net>; Sean Rosenfeld <srosenfeld@AltaMesa.net>; Cathy Radvansky <cradvansky@AltaMesa.net>; David M. Smith <dsmith@AltaMesa.net>; Kevin A. Logan <klogan@AltaMesa.net>; Kerima Haddad <khaddad@AltaMesa.net>; Erick Nefe <enefe@AltaMesa.net>; Hector L. Caram <hcaram@AltaMesa.net>; John E. Mason <jmason@AltaMesa.net>; Kathy Sheen <ksheen@AltaMesa.net>

**Subject:** Lets stay away from the two eastern sections in 16-5. BUT lets not give up on 15-5.

I raised the red flag here once before, but the Opus One had given me hope, but Abbas has that at 140 mbo. So, we are zero for three in these 12 sections so far. Granted one of the wells (Vieth) had small fracs put on it.

Lets definitely not give up on the two eastern sections in 15-5. We have only one well on line, the Cronkite at 150 mbo, which had a casing failure.

The fact that as we move south, the Nemaha is further east may play a role in these EURs.

Comments?

Mike

**PX 339**

**From:** Jim Hackett <jimt@jimthackett.com>  
**Sent:** Wed, 8 Aug 2018 20:57:26 +0000 (UTC)  
**To:** "Lapeyre, Pierre F." <pierre@riverstonellc.com>  
**Subject:** Re: Confidential

---

Thanks.

---

**From:** Pierre Lapeyre <pierre@riverstonellc.com>  
**Date:** Wednesday, August 8, 2018 at 4:57 PM  
**To:** James Hackett <jimt@jimthackett.com>  
**Subject:** Re: Confidential

Plan to dig in tonight when i get home and will email if it all changes what i sent you yesterday

---

On: 08 August 2018 16:55,  
"Jim Hackett" <[jimt@jimthackett.com](mailto:jimt@jimthackett.com)> wrote:

We are just going through traps to get model sent to you, which is imminent.

---

**From:** Pierre Lapeyre <pierre@riverstonellc.com>  
**Date:** Wednesday, August 8, 2018 at 4:54 PM  
**To:** James Hackett <jimt@jimthackett.com>  
**Subject:** Re: Confidential

I did actually get it earlier. Just missed it. I have asked scott for the model details beyond it. I also think you cant just look at irr we eat dollar profits/npv not irr points. I think the warrant may distort an irr only analysis

---

On: 08 August 2018 15:56,  
"Jim Hackett" <[jimt@jimthackett.com](mailto:jimt@jimthackett.com)> wrote:

This is the AMR slide deck – sent it to you earlier. Also, you received one from Scott Grandt. Are the slides not coming through to you? Jim

---

**From:** James Hackett <jimt@jimthackett.com>  
**Date:** Wednesday, August 8, 2018 at 12:07 PM  
**To:** drew karian <dkarian@riverstonellc.com>, "Tichio, Robert" <rtichio@riverstonellc.com>  
**Cc:** Pierre Lapeyre <pierre@riverstonellc.com>  
**Subject:** Confidential

**Exhibit  
0692**

6/13/2023  
Lapeyre

This deck will be going out to the full Board, shortly. Please keep the deck confidential within the Riverstone family. It has what is considered Material Non-Public Information and that message should be passed on to anyone who receives the deck inside Riverstone. Thank you. Jim

CONFIDENTIALITY NOTICE:

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**PX 340**

**MINUTES OF THE TELEPHONIC MEETING OF THE BOARD OF DIRECTORS  
OF ALTA MESA RESOURCES, INC.**

**August 10, 2018**

A telephonic meeting of the Board of Directors of Alta Mesa Resources, Inc., a Delaware corporation (the “*Company*”), was held on August 10, 2018, at 2:00 p.m. (CST). Notice of the meeting had been given in accordance with the bylaws of the Company. James T. Hackett occupied the Chair and Kimberly O. Warnica, Vice President, General Counsel, Chief Compliance Officer and Secretary, acted as Secretary. The following Board members were present for the meeting:

Harlan H. Chappelle

Michael E. Ellis

Don Dimitrievich

Sylvia J. Kerrigan

Pierre F. Lapeyre Jr.

David M. Leuschen

William W. McMullen

Donald R. Sinclair

Jeffrey H. Tepper

Diana J. Walters

Also present were Michael A. McCabe, Vice President and Chief Financial Officer, and Scott R. Grandt, Vice President of Finance and Investor Relations, of the Company.

Mr. Hackett called the meeting to order, welcoming those in attendance.

**Return of Capital Discussion**

Mr. Chappelle provided an overview with respect to the Company’s stock trading as well as investor and advisor feedback. Mr. Grandt then reviewed the rationale and considerations associated with a stock repurchase as compared to a warrant repurchase. There was a robust discussion around alternative uses of cash and the impact a repurchase program would have on the Company’s leverage as well as liquidity. The Directors and management discussed the potential effects of a repurchase program in a lower pricing environment. Mr. Grandt then discussed sizing considerations associated with the share purchase program, including volume limitations and timing to complete. Mr. McMullen informed the Directors that Bayou City Energy was contemplating buying between \$15 million and \$25 million of the Company’s stock independent of the Board’s decision with respect to the repurchase program.

**Approval of Common Stock Repurchases**

**WHEREAS**, it has been proposed that the Company repurchase from time to time in the open market or through privately negotiated transactions shares of the Company’s Class A

Common Stock, par value \$0.0001 per share ("Company Stock") in an amount not to exceed \$50 million;

**WHEREAS**, the capital of the Company is sufficient under Delaware law to repurchase the Company Stock authorized hereby; and

**WHEREAS**, the Board of the Company deems it to be advisable for business reasons and in the best interests of the Company that such repurchases of Company Stock be effected.

**NOW, THEREFORE, BE IT RESOLVED**, that the repurchase by the Company (which may be effected from time to time in accordance with the terms of applicable federal and state securities laws and regulations, including, without limitation, Rule 10b-18 of the Securities Exchange Act of 1934) in the open market or through privately negotiated transactions of shares of Company Stock in an amount not to exceed \$50 million, exclusive of any fees, commissions or other expenses related to such repurchases is hereby authorized and approved;

**RESOLVED FURTHER**, that the President and Chief Executive Officer, the Vice President and Chief Financial Officer, or the Secretary of the Company (each a "*Proper Officer*") are, and each of them hereby is, authorized, empowered and directed to determine and approve the terms, including, without limitation, the quantity, timing, price and purpose, of such repurchases of Company Stock;

**RESOLVED FURTHER**, that such repurchases shall be consummated only to the extent that they do not impair the Company's capital or its ability to pay its debts within the meaning of Section 160 of the Delaware General Corporation Law;

**RESOLVED FURTHER**, that the Company Stock repurchased shall be retired under Section 243 of the Delaware General Corporation Law and returned to the status of authorized but unissued shares of Common Stock;

**RESOLVED FURTHER**, that the Proper Officers of the Company are, and each of them hereby is, authorized, empowered and directed to determine and approve the engagement of one or more investment bankers to act as agent for the Company in connection with the repurchase of Company Stock;

**RESOLVED FURTHER**, that the Proper Officers of the Company and each subsidiary of the Company hereby is authorized, empowered and directed, for and on behalf of any such corporation of which such person is an officer, to deliver to any person or entity any corporate papers, certificates or other documents that may be required by any of them and to do any other lawful acts and things and to enter into and execute any documents or instruments that in the opinion of those officers are necessary or desirable in connection with the carrying out by such corporation of the repurchase of Company Stock and the transactions contemplated thereby, including without limitation, (i) the issuance of a press release, (ii) the filing of any notices, reports or other documents required to be filed under the federal securities laws in connection with the foregoing, (iii) borrowing funds under the Alta Mesa Holdings, LP's

amended and restated credit facility, (iv) paying all such fees, costs and expenses, in the name and on behalf of the Company or any such subsidiary, and (v) where necessary or appropriate, filing with the appropriate governmental authorities all such further certificates, instruments or other documents as in the judgment of any such officer shall be necessary or advisable in order to effect the intent and purposes of the repurchase of Company Stock and these resolutions;

**RESOLVED FURTHER**, that should the consummation of the transactions authorized in the foregoing resolutions require additional or more specific authorization of actions to consummate the transactions contemplated herein, including, without limitation, the execution and delivery of any and all agreements, instruments, documents or filings, such additional or specific authorizations hereby are deemed to be included herein as of the date hereof;

**RESOLVED FURTHER**, that any and all prior lawful actions taken by any Proper Officer of the Company and any subsidiary of the Company or any person or persons designated and authorized to act by a Proper Officer of the Company or any subsidiary of the Company in connection with the negotiation, execution, delivery and performance of the repurchase of Company Stock and any documents related thereto which would have been authorized by the foregoing resolutions except that such actions were taken prior to the adoption of the foregoing resolutions are severally authorized, ratified, confirmed, approved and adopted as being action of the Company or any subsidiary of the Company, as applicable;

**RESOLVED FURTHER**, that the execution and delivery by any Proper Officer of the Company or any subsidiary of the Company of any of the agreements, documents and instruments authorized in the foregoing resolutions, and the taking by any such officer of any lawful acts in any way relating to the transactions contemplated by the foregoing resolutions, shall be conclusive (but not exclusive) evidence of the approval thereof by the Board of the Company, and of the authority of the officer to execute and deliver and take the same in the name and on behalf of the Company or any subsidiary of the Company, as applicable; and

**RESOLVED FURTHER**, that these resolutions may be executed in one or more counterparts, each of which shall be an original and all of which when taken together shall constitute one and the same document.

#### **Approval of AMH Credit Agreement Amendment**

**WHEREAS**, Alta Mesa Holdings, LP (the “**Borrower**”) desires to enter into that certain Amendment No. 2 (the “**Amendment**”) to the Eighth Amended and Restated Credit Agreement dated February 9, 2018 (the “**Credit Agreement**”) by and among the Borrower, the lenders party thereto from time to time (the “**Lenders**”) and Wells Fargo Bank, National Association, as Administrative Agent and an Issuing Lender for the Lenders;

**WHEREAS**, all defined terms contained herein and not otherwise defined shall have the meanings ascribed to them in the Credit Agreement; and

**WHEREAS**, the Board has been advised of the material terms of the Amendment and has determined that (a) the Company and the Borrower will receive direct and indirect economic benefit from the Amendment and (b) it is in the best interest of the Company and the Borrower to enter into the Amendment.

**NOW, THEREFORE, BE IT RESOLVED**, that each of Alta Mesa Holdings GP, LLC, a Texas limited liability company and the general partner of the Borrower (the “**General Partner**”), and the Borrower are hereby authorized to enter into the Amendment upon the terms and conditions disclosed to the Board and on such additional or different terms and conditions as Harlan H. Chappelle, President and Chief Executive Officer of the General Partner, or Michael A. McCabe, Chief Financial Officer of the General Partner (individually, a “**Responsible Officer**” and collectively, the “**Responsible Officers**”) deem necessary or advisable;

**RESOLVED FURTHER**, that a Responsible Officer be and hereby is, without the necessity for joinder of any other person, authorized, empowered and directed for and on behalf of the General Partner and the Borrower, to execute and deliver the Amendment in the form and upon the terms as a Responsible Officer may approve, such approval to be conclusively established by such officer’s execution and delivery thereof;

**RESOLVED FURTHER**, that subsequent to the execution and delivery of the Amendment, the Responsible Officer is authorized and directed to cause the General Partner and the Borrower to perform its respective duties in accordance with the terms;

**RESOLVED FURTHER**, that a Responsible Officer be, and hereby is authorized, empowered and directed for and on behalf of the General Partner and the Borrower, to execute and deliver all such other documents, instruments, certificates and agreements, including any other related agreements that the Responsible Officers shall deem necessary or advisable (collectively, “**Contracts**”) and any cash management agreements; and to pay all such expenses and do and perform all such other acts as may be required to consummate the transactions contemplated by the Amendment (including, without limitation, the granting of security interests), the Contracts, any cash management agreements and any amendments thereto, and any other documents defined as Loan Documents under the Credit Agreement;

**RESOLVED FURTHER**, that any and all actions by a Responsible Officer, for and on behalf of and in the name of the General Partner or the Borrower, prior to the adoption of the foregoing resolutions, in connection with any of the foregoing matters, including, but not limited to, negotiations of the terms and/or the execution and delivery of the Amendment, Loan Documents, Contracts and any cash management agreements be, and hereby are, ratified, confirmed and approved as the true and lawful acts of the General Partner and the Borrower, in all respects for all purposes; and

**RESOLVED FURTHER**, that any and all documents, certificates, instruments and agreements executed in connection with the Amendment, Loan Documents, Contracts and any cash management agreements, including any amendments thereto, may contain such effective

dates, whether prior to or after the date of adoption of these resolutions as set forth below, as the Responsible Officer may, in his sole discretion, deem necessary or advisable.

**Adjournment**

With no further matters to discuss, the meeting was adjourned.

Kim Warnica, Secretary

# PX 341

**From:** Jim Hackett <jhackett@AltaMesa.net>  
**Sent:** Tue, 21 Aug 2018 19:34:11 +0000 (UTC)  
**To:** "rtichio@riverstonellc.com" <rtichio@riverstonellc.com>; David Leuschen<david@riverstonellc.com>; "Pierre F. Lapeyre" <pierre@riverstonellc.com>  
**Subject:** Fwd: Goodwill Impairment Assessment - Q218  
**Attachments:** Goodwill Impairment Model \_v2.xlsx;ATT00001.htm

---

Gentlemen,

I have attached some information on a goodwill impairment analysis at AMR. It seems only Diana Walters and I get excited about this analysis. We have had to request the analysis in the last two Audit Committee meetings. If you have a chance to review it, the attached analysis indicates that a B/E share price above \$6 is required for AMR to avoid an impairment of goodwill from the merger at any quarter-end. If we trade up to \$5 at the end of Q3, we will likely have a nearly \$250MM non-cash impairment of goodwill. The actual amount varies by the amount of share repurchases we accomplish in Q3, which not surprisingly reduces AMR's market capitalization and increases the impairment by \$30MM of the \$50MM authorization.

As a management team, we are just starting to learn to look ahead a quarter or two, while also challenging ourselves with how to look backward and further forward with reasonable precision.

Mike McCabe will cover this analysis formally in our September Board meeting, but I wanted to give you a heads-up.

Jim

Mike McCabe,

I presume we want to prepare the Audit Committee and Board prior to Q3 results for the fact that we may have an impairment if the share price doesn't accelerate upward meaningfully. Perhaps you want to cover this in your CFO report at the Board meeting?

Thanks,  
Jim

Begin forwarded message:

**From:** William Henderson <whenderson@AltaMesa.net>  
**Date:** August 21, 2018 at 8:55:14 AM CDT  
**To:** Jim Hackett <jhackett@AltaMesa.net>, "Michael A. McCabe" <mmccabe@AltaMesa.net>, Scott Grandt <sgrandt@AltaMesa.net>, "Ronald J. Smith" <rsmith@AltaMesa.net>  
**Subject:** FW: Goodwill Impairment Assessment - Q218

Gentlemen –

Attached is our goodwill impairment calculation based on an assumed \$5.00 per share closing stock price at the end of Q3 2018.

I have included 2 scenarios – one with no stock repurchased during Q3 and one with the full authorized amount spent during Q3 for stock repurchases. The assumptions in blue may be changed as desired to look at different alternatives. I've also included a data table for each scenario that provides different goodwill impairment results at different prices and different control premiums.

Exhibit  
CP 0336

Walters

Please let me know if I can be of further assistance.

Bill

---

**From:** Ronald J. Smith

**Sent:** Monday, August 20, 2018 10:50 AM

**To:** William Henderson <[whenderson@AltaMesa.net](mailto:whenderson@AltaMesa.net)>

**Subject:** FW: Goodwill Impairment Assessment - Q218

Bill – can you update and provide using this parameter.

---

**From:** Jim Hackett

**Sent:** Monday, August 20, 2018 10:43 AM

**To:** Ronald J. Smith <[rsmith@AltaMesa.net](mailto:rsmith@AltaMesa.net)>

**Cc:** Scott Grandt <[sgrandt@AltaMesa.net](mailto:sgrandt@AltaMesa.net)>; Michael A. McCabe <[mmccabe@AltaMesa.net](mailto:mmccabe@AltaMesa.net)>

**Subject:** RE: Goodwill Impairment Assessment - Q218

Simply as information, could we run this model as if we were trading at \$5/share at the end of Q3? Thanks.

---

**From:** Jim Hackett

**Sent:** Monday, August 20, 2018 10:40 AM

**To:** Ronald J. Smith <[rsmith@AltaMesa.net](mailto:rsmith@AltaMesa.net)>

**Cc:** Scott Grandt <[sgrandt@AltaMesa.net](mailto:sgrandt@AltaMesa.net)>; Michael A. McCabe <[mmccabe@AltaMesa.net](mailto:mmccabe@AltaMesa.net)>

**Subject:** RE: Goodwill Impairment Assessment - Q218

Excellent. I apologize since I was looking at the table and assumed some additional NPV (versus multiples) analysis was required.

Thanks,

Jim

---

**From:** Ronald J. Smith

**Sent:** Monday, August 20, 2018 10:29 AM

**To:** Jim Hackett <[jhackett@AltaMesa.net](mailto:jhackett@AltaMesa.net)>

**Cc:** Scott Grandt <[sgrandt@AltaMesa.net](mailto:sgrandt@AltaMesa.net)>; Michael A. McCabe <[mmccabe@AltaMesa.net](mailto:mmccabe@AltaMesa.net)>

**Subject:** RE: Goodwill Impairment Assessment - Q218

The quantitative assessment is embedded towards the end of the document. Attached is the worksheet that is the source. This is the “informal” version that we will used each quarter, except when we do the annual test in October.

---

**From:** Jim Hackett

**Sent:** Monday, August 20, 2018 10:26 AM

**To:** Ronald J. Smith <[rsmith@AltaMesa.net](mailto:rsmith@AltaMesa.net)>

**Cc:** Scott Grandt <[sgrandt@AltaMesa.net](mailto:sgrandt@AltaMesa.net)>; Michael A. McCabe <[mmccabe@AltaMesa.net](mailto:mmccabe@AltaMesa.net)>

**Subject:** RE: Goodwill Impairment Assessment - Q218

Ron,

This is a very good summary of the Qualitative assessment of the GW impairment analysis.

Can I get the Quantitative one as well, or do we simply do that annually?

Thanks,

Jim

**From:** Ronald J. Smith  
**Sent:** Monday, August 20, 2018 10:17 AM  
**To:** Jim Hackett <[jhackett@AltaMesa.net](mailto:jhackett@AltaMesa.net)>  
**Cc:** Scott Grandt <[sgrandt@AltaMesa.net](mailto:sgrandt@AltaMesa.net)>; Michael A. McCabe <[mmccabe@AltaMesa.net](mailto:mmccabe@AltaMesa.net)>  
**Subject:** Goodwill Impairment Assessment - Q218

Attached is Goodwill assessment memorandum as of June 30, 2018.

*Ronald J Smith*  
Vice President and Chief Accounting Officer  
Alta Mesa Resources, Inc.  
15021 Katy Freeway, Suite 400  
Houston, Texas 77094  
[REDACTED]

**PX 342**

**From:** "Hackett, Jim" <JHackett@riverstonellc.com>  
**Sent:** Fri, 19 Oct 2018 15:53:38 +0000 (UTC)  
**To:** "Tichio, Robert" <rtichio@riverstonellc.com>; "Leuschen, David" <david@riverstonellc.com>; "Lapeyre, Pierre F." <pierre@riverstonellc.com>  
**Subject:** Model review at AMR

---

We spent about five hours yesterday with the Meridian, BCE, and HPS reps going through models, as we prepare to present a 2019+ forecast for the Board to review and approve in December.

As you might guess, the Meridian team has a more conservative view of wells per section and recoveries than does AMR. Randy Limbacher, et. al. have been “masters of the universe” in terms of gaining cooperation and respect from AMR management, while still questioning their projections. Randy, Will McMullen (BCE) and I have all spoken this morning. I will reach out to Don D. as well.

If you have any questions, please give Randy or me a call. The Meridian team is doing a deeper dive with the AMR team next week, on technical and capital spending issues.

We still have a separate stream of work occurring with a former E&P CAO and CFO regarding the accounting capabilities of AMR. Diana Walters (Audit Chair) and I are shepherding this initiative.

Exhibit  
CP- 0298  
4/4/2023  
Leuschen